

FEDERAL HIGHWAY ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT
FOR


STP-238-x(615)
TRACS No. 179 YV 304 H3414 OIL
SR-179, Village of Oak Creek to Sedona
Yavapai and Coconino Counties, Arizona

The Federal Highway Administration has determined that this project will not have any significant impact to the human or natural environment. This Finding of No Significant Impact is based upon the attached Environmental Assessment, which has been independently evaluated by the Federal Highway Administration and determined to adequately discuss the environmental issues and impacts of the proposed project. The Environmental Assessment provides sufficient evidence and analysis for the Federal Highway Administration to determine that an Environmental Impact Statement is not required. The Federal Highway Administration takes full responsibility for the accuracy, scope, and content of the Environmental Assessment.

This corridor will utilize Alternative C, as the baseline and overall concept plan, including the bifurcated alignments in the Coconino National Forest segment. Construction of this project, as described in the attached Environmental Assessment, will be in accordance with a Needs-Based Implementation Plan. Under this plan, the overall project will be broken into various construction projects within the corridor. Each project's implementation will be based on needs identified through a segment-by-segment evaluation.

Jan. 16, 2003

Date


for Division Administrator

Arizona Department of Transportation
Intermodal Transportation Division
Environmental Planning Group
205 South 17th Avenue
Phoenix, Arizona 85007

**Final Environmental Assessment
And Section 4(f) Evaluation
for**

SR 179 (VILLAGE OF OAK CREEK TO SEDONA)

Coconino and Yavapai Counties, Arizona
Project No. STP-238-x(615)
TRACS No. 179 YV 304 H3414 01L

Approved by:  On: 12-20-02
RICHARD M. DUARTE, Manager

This environmental assessment has been prepared in accordance with provisions and requirements of Chapter 1, Title 23 USC, 23 CFR Part 771, relating to the implementation of the National Environmental Policy Act of 1969.

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LIST OF ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ACIDS	Arizona CERCLA Information and Data System
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADT	average daily traffic
AGFD	Arizona Game and Fish Department
AR-ACFC	rubber-modified porous asphalt friction course
AT&T	AT&T Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
COE	U.S. Army Corps of Engineers
dBA	A-weighted sound level in decibels
DCR	Design Concept Report
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
EPG	Environmental Planning Group
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
I-17	Interstate 17
LOS	level of service
LUST	leaking underground storage tanks
MP	milepost
mph	miles per hour
msl	mean sea level
NAC	Noise Abatement Criteria
NAP	Noise Abatement Policy
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
PISA	Preliminary Initial Site Assessment
RCRA	Resource Conservation and Recovery Act
ROS	Recreation Opportunity Spectrum
RV	recreational vehicle
SARA	Superfund Amendments and Reauthorization Act
SEE	social, economic, and environmental
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMS	Scenery Management System
SR	State Route
SSD	stopping sight distance

LIST OF ACRONYMS AND ABBREVIATIONS - CONTINUED

SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tanks
VMS	Visual Management System
VMT	Vehicle Miles Traveled
WQARF	Water Quality Assurance Revolving Fund
VOC	Voice of Choice
VQO	Visual Quality Objectives

Mitigation Measures

The following mitigation measures and commitments are not subject to change without the prior written approval of the Federal Highway Administration.

Arizona Department of Transportation Design Responsibilities

1. The final roadway surface course will consist of 1.3-centimeter (0.5-inch)-thick rubber-modified porous asphalt friction course. (Refer to page 27.)
2. The Arizona Department of Transportation will maintain existing access to properties during construction. (Refer to page 41.)
3. The Arizona Department of Transportation will coordinate with the appropriate utility companies on facility relocations during final design. (Refer to page 43.)
4. The Arizona Department of Transportation will work with the Big Park Regional Coordinating Council, the Village of Oak Creek, the City of Sedona's Citizens Advisory Committee, and other appropriate organizations during the final engineering design process to address concerns related to construction work scheduling and aesthetic design issues. (Refer to page 45.)
5. Any extensions of the existing concrete box culverts at mileposts 308.4 and 309.9 will be constructed at the same size or larger to accommodate the existing trail crossings. (Refer to page 53.)
6. Final locations, lengths, and heights of noise abatement measures for the recommended 12 residential receivers will be determined in final design. (Refer to page 58.)
7. A resource protection plan will be included in the construction documents to identify sensitive areas such as riparian areas and natural rock outcrops within the project limits that will need to be protected from construction impacts. (Refer to page 58.)
8. Any tree or shrub planted will be irrigated for a two-year establishment period. (Refer to page 58.)
9. Revegetation will occur in a progressive manner once a portion of the roadway improvements has been completed. (Refer to page 58.)
10. On National Forest lands, the following plant species will be salvaged and transplanted within the project limits: pinyon pine, juniper, turbinella (scrub) oak, and manzanita. The plant quantity per plant species and plant sizes to be salvaged will be agreed to during final design by the Arizona Department of Transportation and the Coconino National Forest. (Refer to page 58.)
11. All removed riparian woody vegetation (such as cottonwood, sycamore, and ash trees) 10 centimeters (4 inches) or larger in caliper will be replaced with five-gallon container-grown plants or pole plantings of commensurate native species and will be shown on the landscape plans prepared for the project during final design. (Refer to page 58.)

12. Wildlife water collection sources will be provided on both the east and west side of the project near Station 496+200 northbound (milepost 308.3) and Station 496+400 southbound (milepost 308.4). The Arizona Game and Fish Department will maintain these collection sources after construction. (Refer to page 60.)
13. To accommodate wildlife movement in the four Arizona Game and Fish Department-identified wildlife movement corridors, newly constructed box culverts will be at least 1.2 meters (4 feet) high by 1.2 meters (4 feet) wide. (Refer to page 60.)
14. If blasting is required during construction, no blasting will occur between March 1 and August 31 within the 1.6-kilometer (1-mile) radius of the Gibraltar Rock or Cathedral Rock locations to minimize potential impacts to the peregrine falcon. The no-blast area will be identified on the resource protection plans developed during final design and approved by the Coconino National Forest. (Refer to page 68.)
15. The following visual mitigation measures will be incorporated in the final design (Refer to page 85):
 - *ADOT/USFS Guidelines for Highways on National Forest Land* (1994) will be followed on National Forest lands.
 - The Arizona Department of Transportation will use the Federal Highway Administration's *Visual Prioritization Process* (1994) to determine priorities for mitigating visual impacts on National Forest lands. Minimally, disturbed areas that are determined to be a high priority area will be replanted with 24-inch to 80-inch box pinyon pine and juniper trees salvaged from the construction area or from local nursery stock, except in rock formations where planting this size of tree may not be feasible.
 - Retaining walls, sound barriers, bridge piers, and abutments will be treated with a patterned or textured surface or faced with native stone accents in critical visual locations as appropriate to the site-specific location. Retaining walls, sound walls, concrete headwalls, bridge piers and abutments, bridge girders, the underside of the bridge deck, the exposed outward-facing exterior surfaces of the bridge barriers and metal handrails on the bridges will be colored with an approved coloring agent that will blend with the natural surroundings. The colors and patterns or textures to be used on concrete surfaces will be coordinated with the Coconino National Forest, Arizona Department of Transportation, the City of Sedona, the Village of Oak Creek, and other appropriate organizations during final design.
 - A depth of 0.3 meter to 0.6 meter (1–2 feet) of porous fill will be provided around trees adjacent to the toes of slopes. Tree wells and/or other techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by the Arizona Department of Transportation, the Coconino National Forest, and the City of Sedona.
 - Signing and other roadside elements such as reflectors, delineators, and object markers will be limited to those absolutely essential.
 - Any riprap used in the project will blend with the surrounding rock and exposed soil color.
 - To blend with natural rock features, newly exposed rock faces will incorporate characteristics of the adjacent natural rock to include scale, shape, slope, and fracturing to the extent that is practical and feasible as identified through geotechnical testing and constructability reviews. Exposed rock cuts will be evaluated for chemical staining to blend with adjacent natural rock.

- Fill slopes will be 1:2 (vertical to horizontal) with guardrail (weathering steel) in densely vegetated and sensitive areas to provide the least visual impact and to retain as much natural vegetation as possible. Sparsely vegetated and non-sensitive areas will have 1:4 or flatter fill slopes. All fill slopes will be revegetated with native plant species as part of the project using densities similar to adjacent undisturbed areas. The Coconino National Forest will identify the limits of the densely vegetated and sensitive areas.
- Cut and fill slopes will simulate the terrain of the surrounding area. Cut and fill slopes will be constructed with varied slope ratios to leave an irregular, undulating or roughened appearance rather than a uniform grade. The slope ratios will vary from the top to the bottom of the slope face and from station to station.
- Boulders excavated during construction will be considered for use as riprap and facing accents on structures if the rock is competent and as approved by the Coconino National Forest for barrier rock in off-road locations. Boulders not needed for construction needs will be placed beyond the errant vehicle recovery zone in areas where natural rock outcrops exist. These boulders will be placed in random patterns and be partially buried to simulate natural boulders in the landscape.
- Natural tone metals such as weathering steel with non-contrasting finish will be used for guardrails.
- Either planting pockets will be created in cut slopes or stepped retaining walls with plantings will be used at the following approximate locations:
 - C southbound Station 495+640 Right to Station 495+900 Right
 - C northbound Station 495+600 Left to Station 495+900 Left
 - C northbound Station 496+680 Left to Station 496+860 Left
 - C Station 500+920 Left to Station 501+100 Left
 - C Station 502+350 Left to Station 502+560 Left
 - C Station 502+600 Left to Station 503+040 Left
 - C Station 502+000 Right to Station 502+940 Right
 - C Station 503+340 Left to Station 503+480 Left
 - C Station 503+520 Left to Station 503+800 Left

Refer to Appendix C for the station locations on the preliminary roadway plans. Exact locations will be determined during final design.

- All asphalt not reused as part of the project will be removed from site or incorporated into roadway embankments, and the roadbed reshaped, scarified, and revegetated. All abandoned sections of old highway will be obliterated and made to blend with the existing landscape.
- Rock outcrops within the project limits will be left in place if stable and do not create a hazard to the traveling public, interfere with construction, or look out of place in the natural landscape.
- The clearing limits within National Forest lands will be irregular and staked by the contractor for approval by the Coconino National Forest and Arizona Department of Transportation prior to the start of clearing. Limits of clearing will generally extend from the top of slope cuts (including rounding) to

the toe of fills. Straight clearing lines will be avoided where possible by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit.

- The roadway medians and all fill slopes (including material waste areas) and cut slopes flatter than 1:2 (vertical to horizontal) will be planted with drought-tolerant native species using densities similar to adjacent undisturbed areas. No trees will be planted in the median. The medians and fill slopes will not have permanent irrigation systems. The Arizona Department of Transportation will maintain the median plantings between milepost 304.5 to milepost 305.1 and milepost 307.2 to milepost 309.6. In the bifurcated roadway, the Arizona Department of Transportation will maintain plantings within the highway right-of-way/easement area.
 - The Arizona Department of Transportation will work with the City of Sedona to design sign support systems that are “in character” with the urban area if traffic control structures are required as part of the improvements within the city limits.
16. The terms and conditions of the United States Army Corps of Engineers’ Nationwide 404 Permits will be followed for work affecting Oak Creek, Jacks Canyon, and any of the unnamed washes within the study area that are under the jurisdiction of the United States Army Corps of Engineers. (Refer to page 89 and Appendix I.)
 17. All required Section 401/404 permits will be obtained prior to construction. (Refer to page 89.)
 18. The “temporary” erosion control measures will be left in place until the Arizona Department of Transportation determines that the site is stabilized as identified in the Storm Water Pollution Prevention Plan. (Refer to page 91.)
 19. Reconstruction of the bridge will require the use of a catchment mechanism under the structure to intercept construction material inadvertently dropped from the structure. Runoff from the finished bridge deck will not discharge directly into Oak Creek. Storm water runoff from the deck will be directed to a holding tank with the capacity for the 25-year on-site runoff event with a 10 percent freeboard for hazardous material purposes. The Arizona Department of Transportation will be responsible for the maintenance of the holding tank. (Refer to page 91.)
 20. Photographic documentation of the site conditions prior to construction of the Oak Creek bridge will be made by the Arizona Department of Transportation and included in the revegetation plans for use during site restoration. (Refer to page 91.)
 21. To protect runoff-period sediment from entering Oak Creek during construction and during bank stabilization and revegetation after the widening of the bridge at Oak Creek, the Arizona Department of Transportation will employ best management practices guidelines. (Refer to page 92.)
 22. A retaining wall will be constructed to prevent any encroachment of the improvements from disturbing the wetlands associated with Jacks Canyon near milepost 305 (Station 490+800). (Refer to page 92.)
 23. The extensions of the existing culverts at milepost 308.4 and milepost 309.9 and the new culverts that will be constructed along the bifurcated section for these same drainages will be sized to accommodate pedestrian and mountain bike use. (Refer to page 94.)

24. Bell Rock Vista multi-use facility will be replaced by constructing two scenic pull-outs, one near milepost 308.3 (Station 496+200 northbound) and the second near milepost 308.4 (Station 496+400 southbound). The scenic pull-out at Station 496+200 northbound will include replacement of the restroom facilities. The restroom facility will be appropriately sized, sited, and designed to accommodate the expected use of the scenic pull-out as well as to complement the scenic and other site characteristics. (Refer to page 96.)
25. The design and construction of the restroom facility at the northbound pull-out at Bell Rock Vista (Station 496+200/milepost 308.3) will be completed by the Coconino National Forest, with design and construction funding by the Arizona Department of Transportation. (Refer to page 96.)
26. Tour bus parking at the scenic pull-out located near milepost 308.3 (Station 496+000) will be prohibited. Tour buses will be directed to the scenic pull-out located near milepost 307.3 (Station 494+400). (Refer to page 98.)

Arizona Department of Transportation Natural Resources Section Responsibilities

1. Existing invasive species will be treated prior to construction according to Arizona Department of Transportation's Natural Resources Section's invasive species management plan. The Arizona Department of Transportation will continue any necessary treatments following construction completion according to the Natural Resource Section's invasive species management plan. (Refer to page 59.)

Arizona Department of Transportation Environmental Planning Group Responsibilities

1. The Arizona Department of Transportation Environmental Planning Group will conduct surveys for the Arizona agave (*Agave arizonica*) 30 days prior to any ground-disturbing activities. If any Arizona agaves are found, consultation with the United States Fish and Wildlife Service will be initiated and the Coconino National Forest will also be notified if any plants are found on National Forest lands. All Arizona agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest. (Refer to page 67.)
2. The Arizona Department of Transportation Environmental Planning Group will conduct surveys for the Tonto Basin agave (*Agave delamateri*) 30 days prior to any ground-disturbing activities. The Coconino National Forest will be notified if any Tonto Basin agave are found. All Tonto Basin agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest. (Refer to page 68.)
3. The Arizona Department of Transportation's Environmental Planning Group will process any required Section 401/404 permits through the United States Army Corps of Engineers. (Refer to page 89.)
4. The Arizona Department of Transportation Environmental Planning Group will review final plans relative to the Arizona Department of Environmental Quality's Leaking Underground Storage Tanks database at the time final design plans are prepared to properly assess the potential impact on the project of the leaking underground storage tank site associated with the existing Village Square Chevron Station in Sedona. The Arizona Department of Transportation Environmental Planning Group will review the Arizona Department of Environmental Quality Underground Storage Tanks and Leaking Underground Storage Tanks databases for changes in status of existing facilities or the addition of new facilities when project plans are finalized. (Refer to page 93.)

Arizona Department of Transportation Roadside Development Section Responsibilities

1. In accordance with the Arizona Native Plant Law, the Arizona Department of Transportation Roadside Development Section will submit a Notice of Intent to the Arizona Department of Agriculture to clear protected native plants at least 60 days prior to any construction activity, and efforts to salvage, if appropriate, will be delineated. Any salvage efforts on National Forest lands will be coordinated with the Coconino National Forest prior to the Notice of Intent. (Refer to page 68).
2. Arizona Department of Transportation Roadside Development Section will determine who will prepare the Storm Water Pollution Prevention Plan. (Refer to page 90.)

Arizona Department of Transportation District Responsibilities

1. The Arizona Department of Transportation will maintain pavement and drainage structures within the scenic pull-outs. (Refer to page 33.)
2. Any tree or shrub planted will be irrigated for a two-year establishment period. (Refer to page 58.)
3. Revegetation will occur in a progressive manner once a portion of the roadway improvements has been completed. (Refer to page 58.)
4. The revegetation and soil protection efforts on National Forest lands will be examined by the Coconino National Forest and the Arizona Department of Transportation one year after construction. If needed, revegetation efforts will be repeated after this first year of construction. (Refer to page 58.)
5. The clearing limits within National Forest lands will be irregular and staked by the contractor for approval by the Coconino National Forest and the Arizona Department of Transportation prior to the start of clearing. Limits of clearing will generally extend from the top of slope cuts (including rounding) to the toe of fills. Straight clearing lines will be avoided where possible by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Tree wells and/or other techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by the Arizona Department of Transportation, the Coconino National Forest, and the City of Sedona. (Refer to page 86.)
6. The Arizona Department of Transportation will maintain the median plantings between milepost 304.5 to milepost 305.1 and milepost 307.2 to milepost 309.6. In the bifurcated roadway, the Arizona Department of Transportation will maintain plantings within the highway right-of-way/easement area. (Refer to page 86.)
7. Because 0.4 or more hectares (1 or more acres) of land will be disturbed, a National Pollutant Discharge Elimination System permit will be required. The District Construction Office will submit the Notice of Intent and the Notice of Termination to the United States Environmental Protection Agency and copies to the Arizona Department of Environmental Quality. (Refer to page 90.)
8. The Arizona Department of Transportation will monitor all mitigation measures encompassing sedimentation and erosion control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas. (Refer to page 90.)

9. The Arizona Department of Transportation will be responsible for the maintenance of the storm water holding tank at the Oak Creek bridge. (Refer to page 91.)
10. Photographic documentation of the site conditions prior to construction of the Oak Creek bridge will be made by the Arizona Department of Transportation and included in the revegetation plans for use during site restoration. (Refer to page 91.)

Coconino National Forest Responsibilities

1. The Coconino National Forest will be responsible for use management, signs, and the maintenance of the restroom facility at Station 496+200 (milepost 308.3) and of other facilities at the scenic pull-outs. (Refer to page 33.)
2. To minimize ground disturbance, construction access on National Forest lands will be pre-approved by the Coconino National Forest and shown on the project plans. (Refer to page 58.)
3. On National Forest lands, the following plant species will be salvaged and transplanted within the project limits: pinyon pine, juniper, turbinella (scrub) oak, and manzanita. The plant quantity per plant species and plant sizes to be salvaged will be agreed to during final design by the Arizona Department of Transportation and the Coconino National Forest. (Refer to page 58.)
4. The revegetation and soil protection efforts on National Forest lands will be examined by the Coconino National Forest and the Arizona Department of Transportation one year after construction. If needed, revegetation efforts will be repeated after this first year of construction. (Refer to page 58.)
5. Slashings (tree trunks, branches, stumps, cacti and other vegetation) and excess rock and soil material resulting from clearing operations on National Forest lands will be deposited in sites approved by the Coconino National Forest. (Refer to page 59.)
6. If blasting is required during construction, no blasting will occur between March 1 and August 31 within the 1.6-kilometer (1-mile) radius of the Gibraltar Rock or Cathedral Rock locations to minimize potential impacts to the peregrine falcon. The no-blast area will be identified on the resource protection plans developed during final design and approved by the Coconino National Forest. (Refer to page 68.)
7. Retaining walls, sound barriers, bridge piers, and abutments will be treated with a patterned or textured surface or faced with native stone accents in critical visual locations as appropriate to the site-specific location. Retaining walls, sound walls, concrete headwalls, bridge piers and abutments, bridge girders, the underside of the bridge deck, the exposed outward-facing exterior surfaces of the bridge barriers, and metal handrails on the bridges will be colored with an approved coloring agent that will blend with the natural surroundings. The colors and patterns or textures to be used on concrete surfaces will be coordinated with the Coconino National Forest, Arizona Department of Transportation, the City of Sedona, the Village of Oak Creek and other appropriate organizations during final design. (Refer to page 85.)
8. The clearing limits within National Forest lands will be irregular and staked by the contractor for approval by the Coconino National Forest and Arizona Department of Transportation prior to the start of clearing. Limits of clearing will generally extend from the top of slope cuts (including rounding) to the toe of fills. Straight clearing lines will be avoided where possible by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Tree wells and/or other

techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by the Arizona Department of Transportation, the Coconino National Forest, and the City of Sedona. (Refer to page 86.)

Contractor Responsibilities

1. The contractor shall maintain traffic on the Oak Creek bridge during construction. (Refer to page 41.)
2. The contractor shall notify the public of the start of construction by placing notices in local newspapers 14 calendar days prior to the beginning of construction activities affecting traffic flow or access. The contractor shall also notify emergency services such as police and fire departments before construction activities begin as well as maintain continued coordination throughout construction. (Refer to page 45.)
3. The expansion of the parking areas at the two Bell Rock Pathway Trailheads (near milepost 307.3 and milepost 309.9) shall not be done at the same time. Construction activities at the trailheads/scenic pull-outs shall take place between November 1 and April 1. Information signs shall be placed along State Route 179 to inform people of the closure of the trailheads/scenic pull-outs. (Refer to page 51.)
4. The majority of the construction activities adjacent to the Bell Rock Pathway on the roadway near milepost 307.3 and milepost 309.9 shall be conducted during weekdays and not on weekends or holidays. (Refer to page 52.)
5. Temporary signs and flashing lights shall be placed at the H. T. Trail culvert near milepost 309.9 and at the Templeton Trail culvert near milepost 308.4 to warn motorists of pedestrians crossing the highway. Signs shall be posted at the Templeton and North Bell Rock Pathway trailheads alerting the public on either side of this portion of the trail about the construction activities. During active construction, traffic control personnel shall be present to assist trail users who want to cross State Route 179 at this location. (Refer to page 53.)
6. The contractor shall install right-of-way/easement fencing on National Forest lands as a first phase of construction to keep cattle and wildlife from gaining access to the highway and to limit off-road vehicular access. (Refer to page 58.)
7. To minimize ground disturbance, construction access on National Forest lands shall be pre-approved by the Coconino National Forest and shown on the project plans. Any equipment yards, batch plants or other construction-related activities shall occur within the designated limits of disturbance. No construction vehicle movement shall occur on National Forest lands outside the construction access limits. On non-National Forest lands, the contractor shall obtain written permission from the Arizona Department of Transportation District Engineer for construction-related activities outside the designated limits of disturbance. (Refer to page 58.)
8. Vegetation shall be preserved and protected outside of the specified clearing limits. The contractor shall remove trees only when specifically authorized to do so by the Arizona Department of Transportation and shall avoid damaging vegetation that is to remain in place. (Refer to page 58.)
9. Any tree or shrub planted shall be irrigated for a two-year establishment period. (Refer to page 58.)

10. Revegetation shall occur in a progressive manner once a portion of the roadway improvements has been completed. (Refer to page 58.)
11. Slashings (tree trunks, branches, stumps, cacti and other vegetation) and excess rock and soil material resulting from clearing operations on National Forest lands shall be deposited in sites approved by the Coconino National Forest. Brush or roots shall be chipped and spread at the approved sites in a natural, unobtrusive manner. (Refer to page 59.)
12. In compliance with Executive Order 13112 regarding invasive species, all earth-moving and hauling equipment shall be washed prior to entering or leaving the construction site to prevent invasive species seed from leaving the site. The contractor shall contact the Arizona Department of Transportation's Natural Resources Section, at 602.712.6993, to inform it of the wash site location(s). Any fill, seed, or mulch material brought in from off-site shall be free of invasive species, and construction equipment shall be free of invasive species and toxic materials. (Refer to page 59.)
13. To accommodate wildlife movement in the four Arizona Game and Fish Department-identified wildlife movement corridors, newly constructed box culverts shall be at least 1.2 meters (4 feet) high by 1.2 meters (4 feet) wide. (Refer to page 60.)
14. The contractor shall move any riparian reptiles or amphibians (snakes or frogs) encountered during reconstruction of the bridge at Oak Creek out of harm's way. (Refer to page 60.)
15. If blasting is required during construction, no blasting shall occur between March 1 and August 31 within the 1.6-kilometer (1-mile) radius of the Gibraltar Rock or Cathedral Rock locations to minimize potential impacts to the peregrine falcon. The no-blast area will be identified on the resource protection plans developed during final design and approved by the Coconino National Forest. (Refer to page 68.)
16. The following visual mitigation measures shall be incorporated in the final design: (Refer to page 85.)
 - *ADOT/USFS Guidelines for Highways on National Forest Land* (1994) will be followed on National Forest lands.
 - The Arizona Department of Transportation will use the Federal Highway Administration's *Visual Prioritization Process* (1994) to determine priorities for mitigating visual impacts on Coconino National Forest lands. Minimally, disturbed areas that are determined to be a high priority area will be replanted with 24-inch to 80-inch box pinyon pine and juniper trees salvaged from the construction area or from local nursery stock, except in rock formations where planting this size of tree may not be feasible.
 - Retaining walls, sound barriers, bridge piers, and abutments shall be treated with a patterned or textured surface or faced with native stone accents in critical visual locations as appropriate to the site-specific location. Retaining walls, sound walls, concrete headwalls, bridge piers and abutments, bridge girders, the underside of the bridge deck, the exposed outward-facing exterior surfaces of the bridge barriers and metal handrails on the bridges shall be colored with an approved coloring agent that shall blend with the natural surroundings. The colors and patterns or textures to be used on concrete surfaces shall be coordinated with the Coconino National Forest, Arizona Department of Transportation, the City of Sedona, the Village of Oak Creek and other appropriate organizations during final design.

- A depth of 0.3 meter to 0.6 meter (1–2 feet) of porous fill shall be provided around trees adjacent to the toes of slopes. Tree wells and/or other techniques shall be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by the Arizona Department of Transportation, the Coconino National Forest, and the City of Sedona.
- Signing and other roadside elements such as paddleboards, reflectors, delineators, and object markers shall be limited to those absolutely essential.
- Any riprap used in the project shall blend with the surrounding rock and exposed soil color.
- To blend with natural rock features, newly exposed rock faces shall incorporate characteristics of the adjacent natural rock to include scale, shape, slope, and fracturing to the extent that is practical and feasible as identified through geotechnical testing and constructability reviews. Exposed rock cuts shall be evaluated for chemical staining to blend with adjacent natural rock.
- Fill slopes shall be 1:2 (vertical to horizontal) with guardrail (weathering steel) in densely vegetated and sensitive areas to provide the least visual impact and to retain as much natural vegetation as possible. Sparsely vegetated and non-sensitive areas shall have 1:4 or flatter fill slopes. All fill slopes shall be revegetated with native plant species as part of the project using densities similar to adjacent undisturbed areas. The Coconino National Forest will identify the limits of the densely vegetated and sensitive areas.
- Cut and fill slopes shall simulate the terrain of the surrounding area. Cut and fill slopes shall be constructed with varied slope ratios to leave an irregular, undulating or roughened appearance rather than a uniform grade. The slope ratios shall vary from the top to the bottom of the slope face and from station to station.
- Boulders excavated during construction shall be considered for use as riprap and facing accents on structures if the rock is competent and as approved by the Coconino National Forest for barrier rock in off-road locations. Boulders not needed for construction needs shall be placed beyond the errant vehicle recovery zone in areas where natural rock outcrops exist. These boulders shall be placed in random patterns and be partially buried to simulate natural boulders in the landscape.
- Natural tone metals such as weathering steel with non-contrasting finish shall be used for guardrails.
- Either planting pockets shall be created in cut slopes or stepped retaining walls with plantings shall be used at the following approximate locations:
 - C southbound Station 495+640 Right to Station 495+900 Right
 - C northbound Station 495+600 Left to Station 495+900 Left
 - C northbound Station 496+680 Left to Station 496+860 Left
 - C Station 500+920 Left to Station 501+100 Left
 - C Station 502+350 Left to Station 502+560 Left
 - C Station 502+600 Left to Station 503+040 Left
 - C Station 502+000 Right to Station 502+940 Right
 - C Station 503+340 Left to Station 503+480 Left

C Station 503+520 Left to Station 503+800 Left

Refer to Appendix C for the station locations on the preliminary roadway plans. Exact locations shall be determined during final design.

- All asphalt not reused as part of the project shall be removed from site or incorporated into roadway embankments, and the roadbed reshaped, scarified and revegetated. All abandoned sections of old highway shall be obliterated and made to blend with the existing landscape.
 - Rock outcrops within the project limits shall be left in place if stable and do not create a hazard to the traveling public, interfere with construction, or look out of place in the natural landscape.
 - The clearing limits within National Forest lands shall be irregular and staked by the contractor for approval by the Coconino National Forest and Arizona Department of Transportation prior to the start of clearing. Limits of clearing shall generally extend from the top of slope cuts (including rounding) to the toe of fills. Straight clearing lines shall be avoided where possible by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Tree wells and/or other techniques shall be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by the Arizona Department of Transportation, the Coconino National Forest, and the City of Sedona.
 - The roadway medians and all fill slopes (including material waste areas) and cut slopes flatter than 1:2 (vertical to horizontal) will be planted with drought-tolerant native species using densities similar to adjacent undisturbed areas. No trees will be planted in the median. The medians and fill slopes will not have permanent irrigation systems. The Arizona Department of Transportation will maintain the median plantings between milepost 304.5 to milepost 305.1 and milepost 307.2 to milepost 309.6. In the bifurcated roadway, the Arizona Department of Transportation will maintain plantings within the highway right-of-way/easement area.
17. The terms and conditions of the United States Army Corps of Engineers' Nationwide 404 Permits shall be followed by the contractor for work affecting Oak Creek, Jacks Canyon, and any of the unnamed washes within the study area that are under the jurisdiction of the United States Army Corps of Engineers. (Refer to page 89 and Appendix I.)
18. Because 0.4 or more hectares (1 or more acres) of land will be disturbed, a National Pollutant Discharge Elimination System permit will be required. The contractor shall submit the Notice of Intent and the Notice of Termination to the United States Environmental Protection Agency and copies to the Arizona Department of Environmental Quality. (Refer to page 90.)
19. The "temporary" erosion control measures shall be left in place until the Arizona Department of Transportation determines that the site is stabilized as identified in the Storm Water Pollution Prevention Plan. (Refer to page 91.)
20. Construction activities adjacent to Oak Creek shall be coordinated with all of the regulatory and affected agencies. (Refer to page 91.)
21. Roadway catch basins that discharge directly into Oak Creek shall be constructed with skimmers to contain any hydrocarbons, debris, and sediment. (Refer to page 91.)

22. The contractor shall not use water from Oak Creek as a water supply for construction activities. (Refer to page 91.)
23. Construction activities for the bridge at Oak Creek shall take place during low-flow periods, from August through December, to avoid potential impacts to spawning fish. Any required water diversion structure shall allow water to continually flow to permit fish movement up- and downstream. The diversion structure must have the capability to be lowered or readily removed in case of a high-water event so that it would not be washed downstream. (Refer to page 91.)
24. Reconstruction of the bridge shall require the use of a catchment mechanism under the structure to intercept construction material inadvertently dropped from the structure. Runoff from the finished bridge deck shall not discharge directly into Oak Creek. Storm water runoff from the deck shall be directed to a holding tank with the capacity for the 25-year on-site runoff event with a 10 percent freeboard for hazardous material purposes. (Refer to page 91.)
25. The Arizona Department of Environmental Quality shall be notified by the contractor before project construction begins. (Refer to page 91.)
26. The contractor shall follow the Arizona Department of Transportation best management practices guidelines to minimize sediment from runoff periods from entering Oak Creek during construction and during bank stabilization and revegetation after the widening of the bridge at Oak Creek. (Refer to page 92.)

Standard Specifications included as Mitigation Measures

1. According to *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 107.05 Archaeological Features (2000 Edition), if previously unidentified cultural resources are discovered during construction, the contractor shall stop work immediately at the location, take all reasonable steps to secure the preservation of those features, and notify the Arizona Department of Transportation Engineer. The Arizona Department of Transportation Engineer will, in turn, notify the appropriate agency(ies) to evaluate the importance of the resources. (Refer to page 48.)
2. Dust generated from construction activities will be controlled in accordance with the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 104.08 Prevention of Air and Noise Pollution (2000 Edition), special provisions, and local rules or ordinances. (Refer to page 55.)
3. The directives of the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition) to observe and comply with all air pollution ordinances, regulations, orders, etc. from those agencies having jurisdiction will be followed. (Refer to page 55.)
4. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, Section 104.08 Prevention of Air and Noise Pollution (2000 Edition), the Arizona Department of Transportation District Office will direct the contractor to suspend all work activities until further notice in the event that the Governor declares an air pollution emergency for the project area. (Refer to page 55.)
5. The contractor shall be required to meet the noise abatement requirements of Section 104.08 of the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*

(2000 Edition) during the roadway construction. If blasting is required for construction of the improvements, the contractor shall adhere to Section 107.10 of the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition). (Refer to page 56.)

6. According to Section 107.12 of *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition), the contractor shall comply with all Coconino National Forest requirements including providing maintenance commensurate with the contractor's use of the National Forest roads and trails. In addition, the contractor shall not deface, injure, or destroy trees, shrubs, or private property except as required to complete the construction according to Section 107.11 of *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition). (Refer to page 58.)
7. During construction of the project, care shall be taken to ensure that construction materials are not introduced into the washes, in accordance with *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction* Section 104.09 (2000 Edition) and the Water Quality Standards in Title 18, Chapter 11 of the Arizona Administrative Code as administered by the Arizona Department of Environmental Quality. (Refer to page 91.)
8. The contractor may use materials from either private, commercial, or Arizona Department of Transportation sources; in any case, the sources shall have separate environmental approvals from the Arizona Department of Transportation according to Section 1001-2 of *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition). (Refer to page 92.)
9. Excess waste material and construction debris shall be disposed of at sites supplied by the contractor. Disposal shall be made at either Municipal Landfills approved under Title D of the Resource Conservation and Recovery Act, Construction Debris Landfills approved under Article 3 of the Arizona Revised Statutes Annotated § 49-241 (Aqua Protection Permit) administered by the Arizona Department of Environmental Quality, or Inert Landfills. Inert landfills are not regulated by the Arizona Department of Environmental Quality. (Refer to page 92.)
10. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, Section 107 Sanitary, Health and Safety Provisions (2000 Edition), if previously unidentified or suspect hazardous materials are encountered during construction, work shall stop at that location and the Arizona Department of Transportation Engineer shall be contacted to arrange for proper assessment, treatment, or disposal of those materials. Such locations shall be investigated and proper action implemented prior to the continuation of work in that location. (Refer to page 93.)

I. PROJECT PURPOSE AND NEED

This Environmental Assessment (EA) was prepared to comply with the National Environmental Policy Act (NEPA) of 1969 and the policies of the Federal Highway Administration (FHWA), as the lead federal agency. The EA process provides steps and procedures to evaluate the potential social, economic, and environmental (SEE) impacts of a proposed action, while providing an opportunity for public, and local, state, and other federal agencies to provide input and/or comment through scoping, public information meetings, and the public hearing. These SEE impacts are measured by their magnitude of impacts based on their context and intensity, as defined in the Council on Environmental Quality's (CEQ) regulations. This EA also provides FHWA and the Arizona Department of Transportation (ADOT) a detailed analysis to better examine and consider the level of impacts on environmental resources and assists in their decision-making process.

ADOT, in conjunction with local public agencies, has identified the need to improve the traffic operations and capacity of State Route (SR) 179 from the Village of Oak Creek to the intersection of SR 89A in Sedona (refer to Figures 1 and 2, pages 2 and 3). SR 179 is one of three routes into Sedona and the Oak Creek Canyon area and is the most direct link to Interstate 17 (I-17) to the south. According to the Sedona-Oak Creek Chamber of Commerce, over four million people visit the area annually. Traffic volumes have increased substantially in the past 10 years, and they are expected to increase in the future along with the area's popularity. Currently, the majority of SR 179 is a two-lane roadway and is operating at or near capacity during peak travel times (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*: ADOT, 2002a). Limited passing opportunities due to the terrain and sight distance, traffic delays created by routine roadway maintenance activities, and numerous intersecting driveways and side streets along SR 179 reduce the effective capacity of the roadway to serve its function as a state highway. These factors are further compounded by the relatively high percentage of trucks, tour buses, and recreational vehicles that use the roadway, as well as a substantial number of motorists who desire to drive more slowly to view the scenery. ADOT is constructing four-lane divided and five-lane roadway sections that will address these factors and will provide acceptable levels of traffic operations and capacity for this section of SR 179 for the design year 2025.

A. Project Background and Overview

SR 179 is a 23.3-kilometer (14.5-mile) route connecting I-17 with SR 89A in central Arizona as shown in Figure 1 on page 2. Traffic conditions on SR 179 have been a concern to the residents, business people, and governments in the Sedona area since the 1980s. This is reflected in two planning documents that were approved and adopted by the City of Sedona. The *Sedona Area Transportation Study* (1991), and the *Sedona Community Plan*, which was initiated in 1988 and adopted by the City Council in November 1991, address traffic conditions on SR 179. The *Sedona Community Plan* was updated in June 1998.

In the *Sedona Area Transportation Study*'s section, pages 111–113, on SR 179, the City of Sedona recognized that traffic growth (projected to be 26,000 vehicles in 2010) "... cannot be accommodated by a two lane rural highway." The study also noted that "... SR 179 does not conform to current highway design standards with regard to sight distance criteria and horizontal and vertical geometric requirements."

The *Sedona Area Transportation Study* identified the need for both short-term improvements to improve traffic operations on SR 179 and the need to consider long-term capacity improvements such as development of a four-lane section on SR 179.

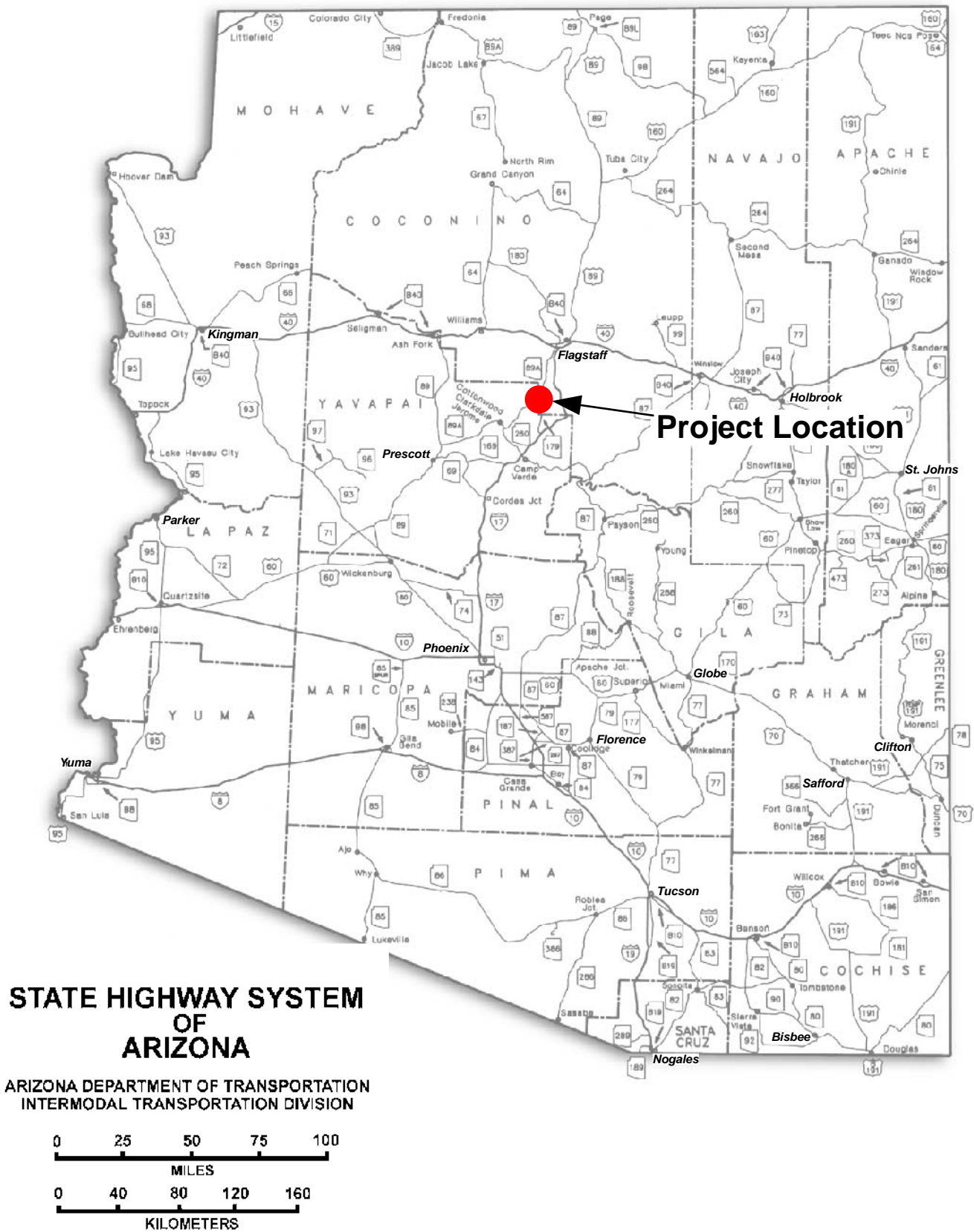


Figure 1. Project location



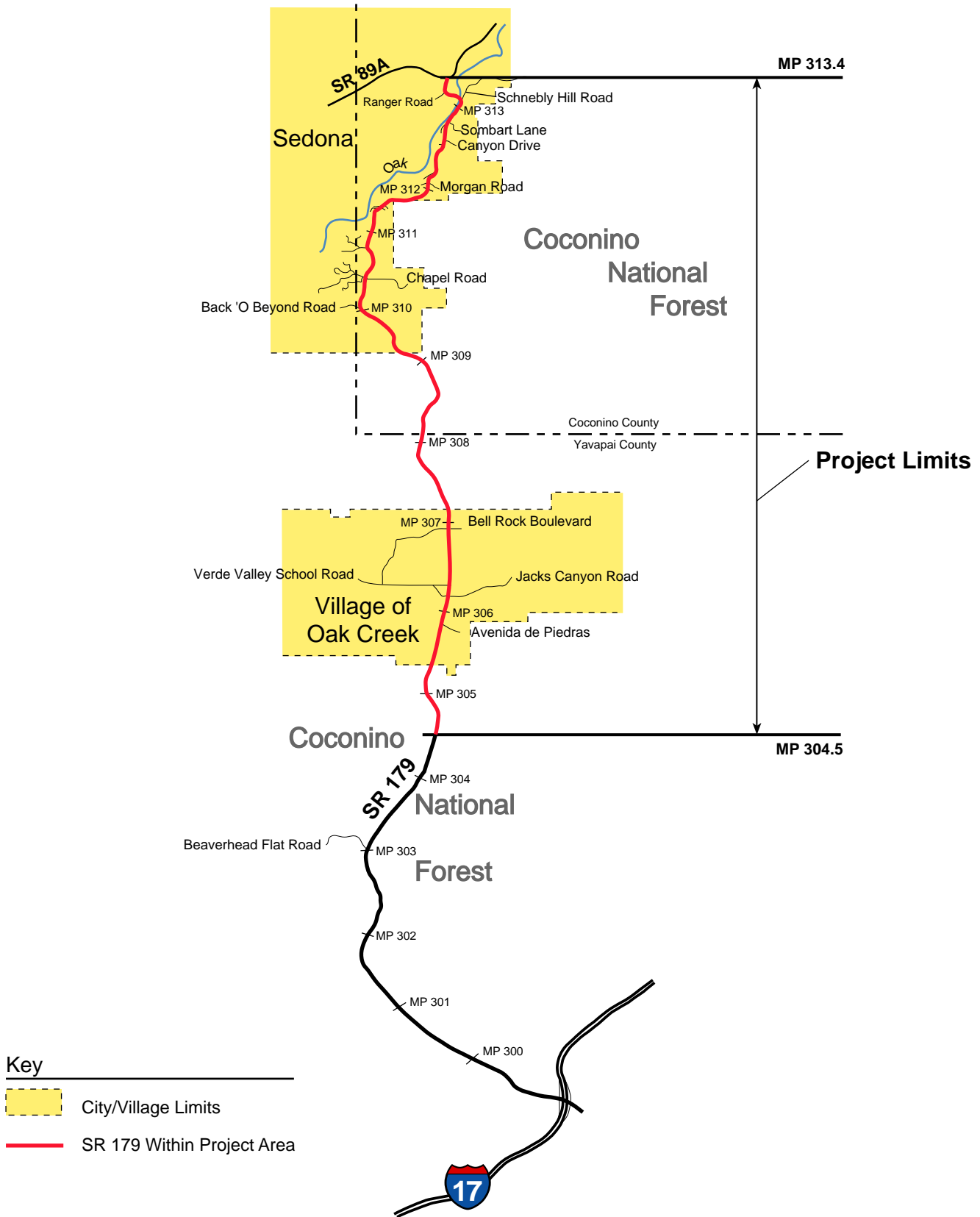


Figure 2. Project area/vicinity location



The 1991 *Sedona Community Plan* also had a Circulation Element (Section 4.3) that addressed SR 179 on pages 4-96 to 4-97. This document included a range of alternatives and evaluative criteria for use in conducting ADOT's *SR 179 Corridor Study* (1992a), which was initiated about the time the *Sedona Community Plan* was completed. The range of alternatives included:

- spot improvements (turn lanes, scenic pull-outs, parking, shoulder widening, upgraded pavement markings, upgraded signing, converting mountable curbs to barrier curbs [to limit access])
- extended improvements - Sedona to the Village of Oak Creek
- full improvements (two-lane, four-lane, five-lane, and two separated two-lane roadways)
- alternative alignments
- a "Do Nothing" scenario

The City of Sedona recommended evaluative criteria for assessing the alternatives in ADOT's *SR 179 Corridor Study*. These criteria included:

- scenic resource impacts
- environmental impacts
- adjacent commercial impacts
- adjacent residential impacts
- wildlife impacts
- air quality impacts
- land use impacts
- safety improvement
- congestion resolution
- right-of-way requirements
- cost of improvements
- ADOT responsibility

ADOT's *SR 179 Corridor Study* was conducted in 1991–1992 as a result of the needs identified in Sedona's transportation planning documents and at citizens' request. The alternatives addressed and the process used to evaluate the alternatives reflected input from the City of Sedona as stated in the 1991 *Sedona Community Plan*. In 1992, ADOT completed the corridor study and environmental overview for SR 179. The purpose of the corridor study was to develop alternative strategies to address existing and future safety and capacity problems, identify environmental considerations, and recommend a course of action that was cost effective, environmentally sound, and acceptable to the affected communities. The corridor study also included an extensive public involvement program as well as close coordination with local, state, and federal agencies. Ten alternative corridors, including the existing corridor, were evaluated; conceptual alignments of these alternatives are included in Appendix A. Options such as transit were discussed but eliminated as viable alternatives because they did not meet the project's purpose or need. The corridor study's recommended alternative was to use the existing corridor for improvements to meet the operational and safety needs of the traveling public.

After completion of the *SR 179 Corridor Study*, ADOT prepared a Design Concept Report (DCR) for a 14.3-kilometer (8.9-mile) segment beginning at milepost (MP) 304.5 and terminating at MP 313.4 as shown in Figure 2 on page 3. The objectives of the study were to propose improvements that would comply with current ADOT and American Association of State Highway and Transportation Officials (AASHTO) design criteria/guidelines and accommodate the projected traffic volumes for the 2025 design year. In addition, because much of SR 179 is within the Coconino National Forest, the improvements must also be consistent with the goals of the *Coconino National Forest Land and Resource Management Plan* (1987).

B. Project Need

According to the Sedona-Oak Creek Chamber of Commerce, the Sedona and Oak Creek Canyon area attracts more than four million tourists per year. The Chamber of Commerce recorded a 68 percent increase in people stopping at its office between 1992 and 1995, which the Chamber interprets as an indication of a corresponding increase in the number of tourists visiting the area. The Coconino National Forest noted an increase of 48 percent in the use of developed recreation facilities between 1974 and 1995. The total population (year-round and seasonal home population) of the city of Sedona has grown from 9,222 in 1990 to 11,170 in 1997, and is projected to grow to 15,284 by 2010 according to the *Sedona Community Plan* (1998).

In view of the existing roadway conditions and the tourism and development growth projected in the Sedona area, ADOT has determined the need to implement improvements to SR 179 to provide efficient traffic movement in the future. According to ADOT projections completed in 2001, average daily traffic (ADT) volume is expected to increase between 36 percent (MP 304.5 to MP 306.0) and 93 percent (MP 311.0 to MP 313.0) by 2025 (refer to Table 2, page 8). In addition to these growing traffic volumes, SR 179 currently experiences over 90 traffic accidents per year within the study area (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*: ADOT, 2002a). SR 179's rolling and curvilinear alignment creates a high percentage of "no passing" zones. This type of alignment also reduces the speeds of large trucks and recreational vehicles, thereby increasing traffic delays. Although some recent improvements have been made, such as signalization of the Bell Rock Boulevard intersection and widening of several unsignalized intersections for turn lanes, continuing traffic growth will increase congestion and operational problems over the next 20-plus years if no action is taken. The 1991 *Sedona Area Transportation Study* indicated that "if a new location cannot be established for a highway, and the existing SR 179 cannot be widened then the character and operation of SR 179 would not serve the function of a state highway and a transfer of administrative jurisdiction may still be appropriate."

1. Transportation System Link

SR 179 is the primary access route from the Phoenix metropolitan area to Sedona and to the recreation areas associated with Oak Creek Canyon and the red rock formations. The highway passes through the Coconino National Forest, the unincorporated Village of Oak Creek, and the city of Sedona. According to the 1989 FHWA *Highway Functional Classification: Concepts, Criteria, and Procedures*, as well as the 1998 ADOT *Arizona Highway Functional Classification System*, the highway is classified as a Rural Minor Arterial from I-17 (MP 299.0) to the Sedona city limits (MP 309.3) and as an Urban Principal Arterial from the city limits to SR 89A (MP 313.4). The change from Rural Minor Arterial to Urban Principal Arterial is based on the location of the Sedona city limit.

SR 179 serves as an important link connecting Sedona and the Village of Oak Creek with I-17. Recognizing that SR 179 provides vital community access functions—and that there are no parallel, alternative routes—it is important to note that not only does this facility balance the through movement mobility, SR 179 also provides the access needs of the local communities.

2. Public Use

The majority of SR 179 is located within the Coconino National Forest. As a part of a public road system on National Forest lands, SR 179 currently serves as a primary access to the Red Rock Ranger District and as an "entry corridor" to National Forest lands, with many signature rock formations in view from the highway. Accordingly, the area adjacent to SR 179 has very high recreational and scenic resource value. In addition, the

State of Arizona designated the highway from MP 302.5 to MP 310.0 as the Red Rock Scenic Road in February 1987. The high volume of recreational use from scenic driving (i.e., slower drivers) and photography and lack of designated pull-out areas create safety problems for vehicles and pedestrians within the corridor, as well as impacts to the land and resources.

3. Existing Conditions

In general, SR 179 consists of two 3.7-meter (12-foot) travel lanes with a varying shoulder width measuring between 0.3 and 2.4 meters (1 and 8 feet). Exceptions to this typical section exist within the Village of Oak Creek where the existing roadway widens to five lanes at Jacks Canyon Road and at Bell Rock Boulevard. In the city of Sedona, turn lanes have been constructed at major intersections and at some developments. SR 179 widens to a three-lane and ultimately a four-lane section between Oak Creek and SR 89A.

Existing posted speed limits for the project portion of SR 179 are 55 miles per hour (mph) from MP 304.5 to MP 305.6, 50 mph from MP 305.6 to MP 306.1, 40 mph from MP 306.1 to MP 311.7, 30 mph from MP 311.7 to MP 313.0, and 25 mph from MP 313.0 to MP 313.44 (see Table 4 on page 10).

AASHTO has established specific criteria for horizontal and vertical curves to provide safe horizontal curve geometry and safe stopping sight distance for any given design speed. Within the project limits, there are 39 existing horizontal curves and 72 existing vertical curves.

Of the 39 horizontal curves, 23 do not meet the AASHTO criteria for superelevation (banking) and/or maximum degree of curvature. Nonconforming horizontal curvature contributes to vehicles running off the road and to their overturning. Of these 23 curves that do not meet AASHTO criteria, the following is known:

- Nine curves exceed the maximum allowable degree of curve.
- Nineteen curves have superelevations that fail to fall within the recommended ranges.

Of the 72 vertical curves, 26 do not meet AASHTO-recommended minimum stopping sight distance (SSD) values. Nonconforming vertical SSD's contribute to rear-end collisions and collisions with objects in the roadway due to poor sight distance. Refer to Appendix B for vertical and horizontal curve deficiencies linked to specific existing locations. Of the 26 curves that do not meet the AASHTO criteria, the following is known:

- Eleven curves have a SSD that is between 21 feet and 91 feet less than the recommended SSD.
- Six curves have a SSD that is between 108 feet and 132 feet less than the recommended SSD.
- Two curves have a SSD that is between 167 feet and 188 feet less than the recommended SSD.
- Six curves have a SSD that is between 203 feet and 270 feet less than the recommended SSD.
- One curve has a SSD that is 318 feet less than the recommended SSD.

The existing two-lane facility can delay emergency response vehicles because of the potential for traffic stoppages, intersection delays, and traffic incidents that block through traffic. Emergency vehicles cannot predetermine response times to a scene if traffic stoppages, intersection delays, or accidents are a common occurrence on their primary route. Existing SR 179 does not provide for safe bypass of emergency vehicles if a lane is blocked. At least 10 feet of clear width is required, and this would encroach into the on-coming lane on most stretches of SR 179.

Most routine maintenance operations require at least a short-duration lane closure. These closures on a two-lane roadway require flaggers to coordinate use of the remaining existing lane for two-way traffic. If the closure distance is long enough to limit sight distance (due to a hill or large trees, etc.) between the closure limits, a lead car ("pilot car") is also required. Lane closures on a four-lane facility do not require flaggers or pilot cars as long as one lane in each direction is available (i.e., only one-half of the roadway is under construction at a time).

If a maintenance schedule calls for certain activities to occur on a given road segment during a time-of-day, day-of-week, and month that would cause considerable traffic delays (e.g., greater than 20 minutes), the ADOT Engineer usually coordinates with local residents, officials, and businesses to assess the feasibility and acceptability of using nighttime operations. Nighttime maintenance operations are inherently problematic. Lighting systems need to be provided for the work zone. The noise and light accompanying nighttime construction can annoy nearby residents. The traveling public may be more inattentive or sleepy while encountering late-night and pre-dawn construction zones than when dealing with daylight zones.

4. Capacity and Demand

Between the Village of Oak Creek and Back 'O Beyond Road, the route is heavily used by visitors stopping to look at Bell Rock, Courthouse Rock, and other scenic landmarks. Local residents also commute between the Village of Oak Creek and Sedona, and the area is used by recreational walkers, hikers, and bicyclists. Along SR 179, there are numerous informal trails used by hikers, bicyclists, and equestrians. Narrow shoulders along the existing two-lane highway provide few safe places to pull off the road to photograph the rock formations or access the Coconino National Forest.

The demand for recreational use along the SR 179 corridor is high and increasing, according to the City of Sedona and the Coconino National Forest. The *Sedona Origin-Destination Study* (1996) indicated that the "proportion of tourist traffic on SR 179 is shown to range as much as 40–50 percent," and the majority of these trips begin or end in the Sedona Uptown area. As noted in the 1996 Study, "trip patterns along SR 179 were primarily between Uptown Sedona, the Village of Oak Creek, and SR 179 south. Few connect with SR 89A west (Cottonwood)." A summary of the trip purposes from the *Sedona Origin-Destination Study* is presented in Table 1. Yavapai County has evaluated alternative routes from SR 179 to West Sedona, but the County is no longer considering these routes. Based on the results of the 1996 *Sedona Origin-Destination Study*, tourists/recreational users would not be expected to use an alternative route because there are no parallel or alternative routes within Sedona.

Table 1. SR 179 origin-destination summaries by trip purpose

Day/Direction	Trip Purposes (percentage of trips)				
	Tourist	Shop	Commute	Business	Other
Friday/Northbound Vehicles	18	26	21	26	9
Friday/Northbound Persons	26	25	18	21	10
Friday/Southbound Vehicles	39	21	11	22	7
Friday/Southbound Persons	54	15	8	15	8
Saturday/Northbound Vehicles	33	30	15	9	13
Saturday/Northbound Persons	40	26	11	7	16
Saturday/Southbound Vehicles	44	24	17	8	7
Saturday/Southbound Persons	51	22	13	6	8

Source: *Sedona Origin - Destination Study*, February 1996, prepared for the City of Sedona

Note: Data collected on November 13–14, 1995, at the Mallard Drive intersection with SR 179. Northbound data collected between 8:00–11:00 a.m. and southbound data collected between 1:00–3:00 p.m.

Table 2 shows the adjusted two-way average daily volumes at five locations along SR 179 between I-17 and SR 89A. These mainline ADT volumes are based on traffic counts collected at five locations in March 2001 for ADOT. ADOT then adjusted the raw counts in accordance with FHWA's *Traffic Monitoring Guide* (2001).

Table 2. Existing 2001 and projected 2025 average daily traffic

Location	2001	2025	Percentage Increase
North of MP 303	10,905	14,837	36
North of MP 306	13,789	21,749	57
North of MP 308	13,403	21,753	62
North of MP 311	14,956	28,865	93
North of MP 313	20,809	36,008	73

Source: Current traffic volumes and 2025 projections provided by ADOT's Transportation Planning Division, April 2001

Projected 2025 ADT volumes range from 14,837 vehicles in the southern portion of the corridor to 36,008 vehicles near SR 89A. These volumes represent an increase of 36 percent between MP 304.5 to MP 306.0 and 93 percent between MP 311.0 to MP 313.0 over the current ADT. According to the *SR 179: Corridor Study Traffic Operations and Safety Analysis* (ADOT 1992a), approximately seven percent of the traffic volume represents commercial trucks, recreational vehicles, and buses. The projections reflect the projected growth of Sedona as a tourism center and the development of outlying areas, such as the Village of Oak Creek.

The method used for describing and determining capacity and traffic operating conditions is outlined in the Transportation Research Board's 2000 *Highway Capacity Manual* and has been expressed in terms of level of service (LOS). A LOS definition generally describes the roadway operating conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels of service are used to define operating conditions, designated by the letters A through F. Figure 3 on page 9 illustrates the various levels of service. LOS A represents the best operating conditions while LOS F represents the worst, with traffic demand exceeding highway capacity for roadways. The LOS criteria for signalized intersections are provided in Table 3. The goal for SR 179 is to provide LOS C or better in the design year of 2025 so that traffic would flow at or near the posted speed limit with minimal restrictions. The posted speed limits range from 25 mph to 55 mph and will not change upon completion of the improvements. The current posted speed limits are shown in Table 4.

If nothing is done to improve the capacity of the existing roadway, the increase in traffic over the next 20-plus years would result in poorer levels of service within the study area, with substantial peak-hour congestion (LOS D, E, or F). Table 5 compares the existing 2001 and projected 2025 levels of service with and without improvements to SR 179 at major intersections within the project limits. The Avenida de Piedras and Jacks Canyon Road intersections are currently multilane crossroads. Table 5 shows that LOS will not substantially worsen in the design year at these intersections, as compared to the other, yet-to-be-improved intersections, which should exhibit a substantial increase in LOS. This points to the fact that additional lanes on the crossroads should make a positive impact on LOS.



Level of Service A. Free flow at posted speed limit, frequent passing opportunities.



Level of Service D. Sluggish flow, no passing opportunities.



Level of Service B. Relatively free flow, limited passing opportunities.



Level of Service E. Very sluggish flow, reduced travel speeds, no opportunity for passing.



Level of Service C. Relatively free flow, but almost no passing opportunities.



Level of Service F. Heavy congestion, frequent stop and go conditions, no passing opportunities.

Figure 3. Level of service classifications

Table 3. Level of service criteria for signalized intersections

Level of Service	Average Control Delay per Vehicle
A	0 to 10.0 seconds/vehicle
B	10.1 to 20.0 seconds/vehicle
C	20.1 to 35.0 seconds/vehicle
D	35.1 to 55.0 seconds/vehicle
E	55.1 to 80 seconds/vehicle
F	>80 seconds/vehicle

Source: *Highway Capacity Manual 2000*, Transportation Research Board Staff 2000

Table 4. SR 179 current posted speed limits

Milepost	Speed
MP 304.5 to MP 305.6	55 mph
MP 305.6 to MP 306.1	50 mph
MP 306.1 to MP 311.7	40 mph
MP 311.7 to MP 313.0	30 mph
MP 313.0 to MP 313.4	25 mph

Source: *Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway*, ADOT, 2002a

Consequences of not satisfying the desired LOS are substantial. Longer overall travel time can result in driver frustration and lost productivity. A longer duration “rush hour” period can include drivers who normally try to avoid roadway congestion and who may not be accustomed to the accompanying demands on the driver. Congested movement on the mainline can result in reduced gaps in traffic, which make entering/exiting the roadway more difficult. Increased congestion can lead to increased accident potential, with increased emergency vehicle response times due to difficulty in accessing the crash site. Table 6 illustrates the LOS on SR 179 in 2025 between Bell Rock Boulevard and Back 'O Beyond Road for a 12-hour period with no improvements to the existing roadway and with the four- or five-lane roadway section. Tables 7 and 8 illustrate the LOS of the SR 179 and SR 89A intersection (also refer to as the “Y”) with no improvements to the existing roadway and with the four- or five-lane-lane roadway section in 2025.

Table 5. Existing 2001 and projected 2025 SR 179 peak-hour level of service

Location	2001 Existing Roadway No Improvements	2025 Existing Roadway No Improvements	2025 Four- or Five-Lane ^a Roadway
North of MP 303	D	D	A
North of MP 308	D	E	A/B
SR 179/Avenida de Piedras Intersection ^b	B	B	B
SR 179/Jacks Canyon Road Intersection ^b	B	C	C
SR 179/Bell Rock Boulevard Intersection	B	E	B
SR 179/Chapel Road Intersection	Unsignalized	D ^c	C ^c
SR 179/Schnebly Hill Road Intersection	Unsignalized	F ^c	B ^c
SR 179/SR 89A Intersection	D	F	C

Source: Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway, ADOT, 2002a

^a A five-lane section consists of two through travel lanes in each direction and a continuous left-turn lane in the center.

^b Already multilane crossroads

^c Assumes signalization

Table 6. SR 179 2025 level of service between Bell Rock Boulevard and Back 'O Beyond Road

Time	2025 Existing Roadway No Improvements	2025 Four- or Five-Lane Roadway
7:00–8:00 a.m.	D	A
8:00–9:00 a.m.	E	A/B ^a
9:00–10:00 a.m.	E	A/B
10:00–11:00 a.m.	E	A/B
11:00–noon	E	A/B
noon–1:00 p.m.	E	A/B
1:00–2:00 p.m.	E	A/B
2:00–3:00 p.m.	E	A/B
3:00–4:00 p.m.	E	A/B
4:00–5:00 p.m. (peak hour)	E	A/B
5:00–6:00 p.m.	E	A/B
6:00–7:00 p.m.	D	A

Source: Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway, ADOT, 2002a

^a LOS differs by direction of travel

Table 7. SR 179 existing roadway No Improvements 2025 LOS at SR 179 and SR 89A intersection

Time	Northbound LOS		Eastbound LOS		Westbound LOS		Intersection LOS/Delay (seconds)
	Left-turn	Right-turn	Thru	Right-turn	Left-turn	Thru	
7:00–8:00 a.m.	C	B	C	A	B	B	C/22
8:00–9:00 a.m.	C	B	C	A	D	C	C/27
9:00–10:00 a.m.	C	B	D	A	E	C	C/33
10:00–11:00 a.m.	D	B	D	A	F	C	C/34
11:00–noon	D	B	D	A	D	C	C/31
noon–1:00 p.m.	D	B	D	A	F	C	D/48
1:00–2:00 p.m.	D	B	D	A	F	C	D/39
2:00–3:00 p.m. (peak hour)	D	C	D	A	F	C	E/55
3:00–4:00 p.m.	D	C	D	A	F	C	D/41
4:00–5:00 p.m.	D	B	D	A	F	C	D/39
5:00–6:00 p.m.	C	B	D	A	D	C	C/31
6:00–7:00 p.m.	C	B	D	A	B	C	C/24

Source: Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway, ADOT, 2002a

According to FHWA's *Flexibility in Highway Design* (1997), several factors can also affect capacity. On roadways where the shoulder width is less than 1.8 meters (6 feet), the lack of an adequate shoulder can reduce capacity as much as 30 percent compared to a roadway with a 1.8-meter (6-foot) shoulder or clear zone. Although much of this portion of SR 179 has minimal shoulder widths, the construction of shoulders would not increase the LOS above E or F in 2025, based on traffic analysis using a two-lane roadway with 1.8-meter (6-foot) shoulders and the projected traffic volumes. Therefore providing 1.8-meter (6-foot) shoulders alone would not meet the desired LOS C for the design year of 2025.

As Table 6 indicates, greatly improved LOS would result if SR 179 was upgraded from the existing two-lane facility to a four- or five-lane typical section. A four- or five-lane typical section would improve the design year 2025 LOS to A or B. A comparison of Tables 7 and 8 shows better LOS with, rather than without, the proposed improvements for the SR 179/SR 89A intersection. For the intersection as a whole, the LOS without the improvements is F for 8 hours, E for 2 hours, and C for 2 hours. With the improvements, however, the intersection LOS is C throughout the day.

Table 8. SR 179 four- or five-lane roadway 2025 LOS at SR 179 and SR 89A intersection

Time	Northbound LOS		Eastbound LOS		Westbound LOS		Intersection LOS/Delay (seconds)
	Left-turn	Right-turn	Thru	Right-turn	Left-turn	Thru	
7:00–8:00 a.m.	C	B	C	A	B	B	C/21
8:00–9:00 a.m.	C	B	C	A	B	C	C/25
9:00–10:00 a.m.	C	B	D	A	B	C	C/25
10:00–11:00 a.m.	D	B	D	A	B	C	C/25
11:00–noon	D	B	D	A	B	C	C/26
noon–1:00 p.m.	D	B	D	A	B	C	C/28
1:00–2:00 p.m.	D	B	D	A	B	C	C/30
2:00–3:00 p.m. (peak hour)	D	C	D	A	C	C	C/32
3:00–4:00 p.m.	D	C	D	A	B	C	C/30
4:00–5:00 p.m.	D	B	D	A	B	C	C/29
5:00–6:00 p.m.	C	B	D	A	B	C	C/28
6:00–7:00 p.m.	C	B	D	A	B	C	C/24

Source: Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway, ADOT, 2002a

5. Community and Coconino National Forest Plans

Yavapai County's *Big Park Community Plan* (June 1998) recognizes the problems associated with the increasing traffic volumes on SR 179, stating "that there are presently potential hazardous driving conditions on SR 179." Additionally, the plan notes that "SR 179 contains steep grades on the east side causing slow turning traffic and creating hazardous drop-offs." Goals and objectives for the Big Park Community include encouraging safe access to and from SR 179 and enhancing the appearance of the roadway through the area. The *Big Park Community Plan's* recommendations include developing an access management plan for the highway that addresses limiting the number of left-hand turn lanes and combining existing driveway curb cuts.

The *Sedona Community Plan* (1998) identifies SR 179 as the primary link between Sedona and I-17, and ultimately to the Phoenix metropolitan area. One of the plan's circulation goals is to "ensure safe and efficient vehicular circulation on SR 89A and SR 179 within Sedona." In addition, the *Sedona Community Plan* recognizes the corridor as a well-known scenic highway and the difficulty in addressing physical roadway improvements without impacting the aesthetic features along the route.

The *Coconino National Forest Land and Resource Management Plan* (1987) identifies management goals for various resource elements including outdoor recreation, wildlife and fish, riparian, range, and transportation that are applicable to the project. The Coconino National Forest amended the Plan for the Sedona area in 1998 and identified specific management areas that have been designated as part of the Sedona-Oak Creek Canyon ecosystem management strategy. These specific management areas emphasize community partnerships for stewardship of the land and visitor orientation. Appropriate uses within these areas include day-use activities

such as wildlife viewing, easily accessible non-motorized trail opportunities, and maintenance of a scenic corridor. The *Coconino National Forest Land and Resource Management Plan* amendment specifically identified the need to partner with ADOT to develop safe scenic turnouts along SR 179.

6. Accidents

Accident rates are a key indicator of traffic safety. They occur for a variety of reasons including driver error, vehicle failure, environmental factors such as weather, and roadway deficiencies. Accident analysis is an essential tool for pinpointing safety problems. For this project, ADOT has provided detailed data on all collisions that occurred on SR 179 between MP 304 and SR 89A (MP 313.4) from March 1, 1995, through February 29, 2000 (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*: ADOT, 2002a).

During the 5-year period from 1995 through 2000, 461 traffic accidents were reported on SR 179 between MP 304 and the intersection with SR 89A, including 141 injury accidents and three fatal accidents. Table 9 shows the location of the reported accidents. Forty-eight percent of these incidents were rear-end accidents, which indicates congestion and frequently stopped or slow vehicles. This large number of rear-end accidents suggests that providing left-turn lanes, deceleration lanes, four-lane divided roadway sections, and pull-outs at appropriate locations could help reduce congestion-related accidents. "T" and left-turn accidents are also related to congestion and should be reduced through these same improvements.

Reduction in the accident potential of other collision types can be attained in several ways (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*: ADOT, 2002a). Reduction in the roadway's horizontal and vertical curvature, along with use of proper pavement cross-slope and wearing surfaces, will reduce the potential for vehicles to turn over in accidents. Guardrails and increased roadside clear zones will reduce the potential for collisions with light poles, traffic signs, or other fixed objects. Accidents involving wildlife-vehicle collisions could be reduced by proper right-of-way fencing, especially Forest Service-approved game fence in the Coconino National Forest. The potential for head-on collisions and sideswipe accidents could be greatly reduced through separation of the directions of travel. Separation is attained by the raised median in the four-lane divided sections, by the natural median in the bifurcated section, and by the paved/raised median in the five-lane section. Other types of accidents accounted for only 13 percent of the total recorded in the 5-year span.

The SR 179 accident rates, expressed in accidents per million vehicle miles traveled (VMT), are provided in Table 9. The rates range from 0.6 to 5.0. All segments north of MP 306.0 exceed the 1990 statewide average accident rate (0.9 to 1.0 accidents per million VMT) for rural highways. In urbanized Sedona between the intersection with SR 89A (MP 313.4) and MP 313.0, the accident rate is 5.0 accidents per million VMT.¹

¹ The latest available analyses for statewide data are from 1990.

Table 9. SR 179 accident rates, 1995–2000

Segment	Accidents per Million Vehicle Miles Traveled	Reported Accidents
MP 304–MP 305	0.6	12
MP 305–MP 306	0.6	12
MP 306–MP 307	3.1	79
MP 307–MP 308	2.0	50
MP 308–MP 309	1.8	45
MP 309–MP 310	1.3	31
MP 310–MP 311	1.8	43
MP 311–MP 312	1.3	36
MP 312–MP 313	2.5	69
MP 313–MP 313.44	5.0	84

Source: *Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway*, ADOT 2002a

C. Project Purpose and Objectives

ADOT is undertaking this project to improve the traffic operations on SR 179. To meet the transportation needs of the public, ADOT has determined that the ultimate facility should provide four through lanes for the entire segment of SR 179 because of the following reasons:

- Limited passing opportunities, traffic delays created by routine roadway maintenance activities, and numerous intersecting driveways and side streets along SR 179, compounded by the relatively high percentage of trucks, tour buses, and recreational vehicles using the roadway, reduce the effective capacity of SR 179 to serve its state highway function.
- The improvements will satisfy current highway design guidelines and meet the planning objectives of the Coconino National Forest, Yavapai and Coconino Counties, the City of Sedona, and the Village of Oak Creek.
- Traffic volumes along the SR 179 corridor are expected to increase between 36 to 93 percent by 2025.
- Emergency services are hindered due to the volume of current and projected traffic and the lack of continuous opportunities to pass other vehicles.
- Narrow shoulders along the existing two-lane highway provide few safe places to pull off the road in emergencies or during vehicle breakdowns.
- The large number of rear-end collisions suggests that providing left-turn lanes and pull-outs at appropriate locations could help reduce the overall collision rate along SR 179.

D.Issues Eliminated from Detailed Study

There are no known sole source aquifers, prime and unique farmland, National Natural Landmarks, or wild and scenic rivers within the project area. Therefore, there will be no impacts to these resources.

II. ALTERNATIVES CONSIDERED

This section describes the alternatives considered for the improvements to SR 179. A range of possible corridors was identified in the 1992 *SR 179 Corridor Study*, and a corridor was selected for further refinement. The DCR developed several alternatives within the selected corridor. The general public and affected agencies participated in the identification and development of these alternatives by providing their input in terms of environmental, engineering, and user considerations. Based on the purpose and need for the project and public and agency considerations, a combination four-lane divided and five-lane highway is the selected alternative.

A. Corridors Considered

In the *SR 179 Corridor Study* (1992a), various solutions to the existing and projected traffic problems on SR 179 were suggested by ADOT, the public, and affected agencies. Ten corridors, including the existing corridor, were identified and are illustrated in Appendix A. The major constraints on the corridors were the steep terrain and proximity of designated Wilderness areas. The corridors were evaluated based on several criteria including traffic utilization, scenic sensitivity, compatibility with local land use and development plans, and number of businesses and residences impacted. The existing corridor was selected based on the environmental considerations, implementation costs, human and service impacts, and input from the public and affected agencies. Four-lane undivided and five-lane sections were suggested as the preferred typical roadway sections.

B. Transit Alternative (rejected)

A rubber-tired trolley has been in operation for more than 10 years within the City of Sedona. This trolley shuttles riders between Uptown (or the downtown commercial district), the Gallery District (south of the Oak Creek bridge along SR 179), and West Sedona (along the SR 89A commercial district west of the intersection of SR 89A and SR 179). This system appears to have moderate ridership and is supported through local commercial establishment advertising. The Coconino National Forest sponsored a transit study in 1997 as part of the preparation of the "Oak Creek Scenic Corridor Action Plan" (unpublished document). The Coconino National Forest's study identified the need to evaluate transit services as one option to address traffic congestion issues. The Coconino National Forest's study also stated that roadway improvements (including capacity improvements), parking policies, and other transportation demand management activities are part of the solution to solve traffic and mobility problems.

The Transportation Planning Division at ADOT and FHWA have looked at the feasibility of transit to improve congestion on SR 179. Along the SR 179 corridor, the attractiveness of a transit service is diminished because of the dispersed nature of the residential development. Most residents in the corridor actually live a substantial distance from SR 179 and consequently would have a considerable distance to walk (or bike) to reach the transit service. In many cases, this distance is combined with notable differences in terrain elevation. These motorists would most likely not use transit unless stringent restrictions on travel and parking by private vehicles were put in place. SR 179 is part of the Arizona State Highway System. Imposing stringent restrictions on travel on a state route would not be compatible with the function of a state highway, which is to move regional and intrastate traffic in a safe and efficient manner.

Commuter traffic includes both people who live in the SR 179 corridor and people who live in other communities further away, particularly in other Verde Valley communities. This type of motorist is typically the most likely

to use transit service, especially if it is of good quality (frequent, reliable, relatively fast, comfortable, and secure). Currently, no inter-community transit service exists that provides an efficient commuter service for the high number of service workers commuting into and out of the Sedona area. Commuters from other communities would need to have either 1) transit service extending to their communities, or 2) convenient and secure park-and-ride facilities near the south end of the corridor. In general, the highly dispersed nature of both the residential development within the corridor and the other communities within reasonable commuting distance make providing effective commuter transit service a relatively expensive proposition. It would also have the common problem of all commuter transit services—the need to provide most of the service in the peak hours, with little demand during off-peak periods. There would be very little benefit to SR 179 because the majority of the affordable housing available to these employees is located in Cottonwood or Cornville and these people use SR 89A as their commuter route.

According to the *Sedona Community Plan*, many visitors to Sedona are day-visitors and do not stay overnight in Sedona. Visitors who travel through Sedona with their own vehicles and continue their trips to other destinations (e.g., Phoenix, Flagstaff, Grand Canyon, Verde Valley) are probably unlikely to use a transit service. The Sedona region is not a “cul-de-sac” as many national parks are; there, park planners can make a visitor transit system more practical because tourists are captive, have come to the location for exclusive recreational purposes, and must follow whatever regulations are established for such visitation (e.g., park-and-ride and transit shuttle service). Tourists also often travel through the Sedona region in a loop drive to other destinations in northern Arizona such as Jerome, Prescott, Flagstaff, and the Grand Canyon and will leave the region via another route (e.g., SR 89A) as opposed to the route on which they arrived (e.g., SR 179). Visitors to the Sedona region often have multiple occupants or a family in one vehicle along with associated refreshments and travel gear and may not be receptive to transferring to a shuttle transit service without substantial incentives such as free shuttle service, discounted admissions to attractions or local establishments, or severely restricted parking. In addition, visitors who come to Sedona via tour bus would not likely use a transit service, because their tour bus would essentially provide the same transportation service as the transit service.

Public funding to implement and operate a transit service of sufficient magnitude and quality to be a viable alternative to capacity improvements along SR 179 is very limited, both in terms of construction and operation/maintenance cost on a long-term basis. An entity would have to be established to effectively implement and operate a transit or shuttle service of sufficient quality and capacity to be a credible and attractive alternative to private vehicles.

Implementing a Transit Alternative was eliminated from further consideration because it alone would not serve to lower the traffic volumes on SR 179, improve the roadway capacity, or meet the needs of the State Highway System for intrastate transportation. Development of a shuttle transit service connecting the Village of Oak Creek with Sedona would require parking facilities at both ends of the route. Because of the dispersed character of origins and destinations in the area, as well as the absence of an efficient local transit system within Sedona, only a small percentage of motorists can be expected to give up the point-to-point convenience of their automobiles. This is especially true because buses would face the same congestion as other vehicles and could not offer shorter travel times than autos along the existing SR 179 cross-section. While public transit in this corridor may be a desirable transportation option for other reasons (patrons who are unable to drive, etc.), it is unlikely to offer enough capacity or attract sufficient ridership to have a large impact on future growth in traffic demand on SR 179. Moreover, implementation of transit service would not address the design deficiencies or safety concerns related to the existing roadway. SR 179 would still require geometric and capacity improvements to satisfy projected traveler demand, even if a transit service is implemented.

C. Voice of Choice Alternative (rejected)

An alternative was presented to ADOT by the Voice of Choice (VOC), a citizens' group organized in opposition to the four- and five-lane expansion of SR 179. The VOC Alternative consists of the following general improvements:

- a two-lane roadway section with 2.4-meter (8-foot) shoulders
- extension of left-turn lanes
- spot improvements, typically involving minor realignment
- a separate 7.9-meter (26-foot)-wide paved forest road connecting the "Roller Coaster"² area to the Bell Rock area
- a roundabout at the SR 179/SR 89A intersection

ADOT estimated the cost of the VOC Alternative is \$30 million in year 2002 dollars. The conceptual alignment for this alternative is shown in Figure 4 on page 20.

Under the VOC Alternative, there would be 49 locations along SR 179 that would not be corrected to meet current AASHTO guidelines for the respective design speeds for both vertical and horizontal curves. Of the 26 vertical curves, 17 curves would have existing stopping sight distance more than 22 percent deficient when compared to current AASHTO guidelines and five curves would be more than 50 percent deficient. This means that, for example, for a design speed of 50 mph, the AASHTO criterion for stopping distance is 144.7 meters (475 feet). With the VOC Alternative, the stopping sight distance would be 65.5 meters (215 feet) at MP 308.5; resulting in a 50 percent deficiency relative to AASHTO guidelines. Of the horizontal curves, 23 curves would not meet the superelevation criterion (degree of banking on the curve) and 11 would not meet the degree of curvature criterion for the given design speed. This means that, at specific locations, motorists would be traveling at speeds greater than the road is designed to safely accommodate.

Table 10 shows the expected 2025 LOS for the VOC Alternative compared with no roadway improvements and with a four- or five-lane roadway. The peak-hour LOS along the roadway would be LOS E or F along SR 179 in 2025 with the VOC Alternative, which would not meet the desired LOS C. In the 4.8-kilometer (3-mile) section between Bell Rock Boulevard and Back 'O Beyond Road, there would be more than a 20-mph difference in travel speed and an additional 2.5 minutes of travel time. A combined peak-hour intersection delay in 2025 at the signalized intersections would be more than 10 minutes with the VOC Alternative.

The VOC alternative does not meet the Coconino National Forest Service's needs for scenic pull-outs nor does it provide safe areas for motorists to stop and photograph the landscape along the Red Rock Scenic Road. The construction footprint (overall disturbed area) would be essentially the same in both the VOC and Alternative C layouts. The VOC alternative has no curbs; ditches would be required to carry the highway runoff. Therefore, in Alternative C's curbed areas, the VOC construction footprint would be larger. The Alternative C footprint would be larger in the divided highway sections. In terms of meeting the purpose and need for the roadway—the return on investment (capacity and safety improvements versus the amount of disturbed area)—Alternative C is preferable.

² Area of SR 179 between approximately MP 308.8 to MP 309.2 that is locally likened to a roller coaster: a series of tight, winding horizontal curves interspersed with frequent, vertical curves.

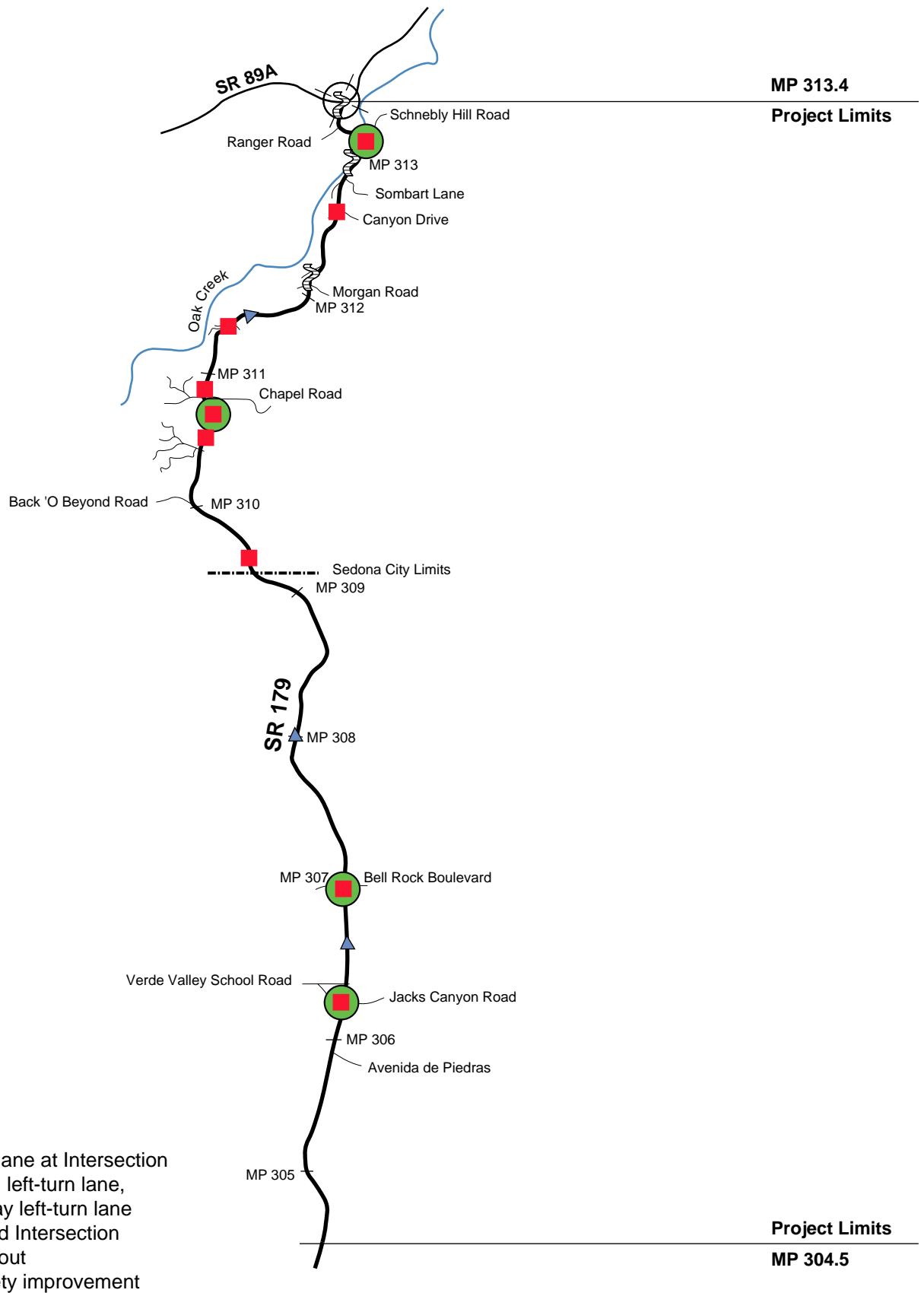


Figure 4. Voice of Choice Alternative



Table 10. Projected 2025 SR 179 peak-hour level of service for No Improvements, Voice of Choice Alternative, and four- or five-lane roadway

Location	2025 Existing Roadway No Improvements	2025 VOC Alternative	2025 Four- or Five-Lane Roadway
North of MP 303	D	D	A
North of MP 308	E	E	A/B
SR 179/Avenida de Piedras Intersection	B	B	B
SR 179/Jacks Canyon Road Intersection	C	C	C
SR 179/Bell Rock Boulevard Intersection	E	E	B
SR 179/Chapel Road Intersection	D ^a	D ^a	C ^a
SR 179/Schnebly Hill Road Intersection	F ^a	F ^a	B ^a
SR 179/SR 89A Intersection	F	E	C

Source: *Final Traffic Operational Analysis Report: SR 179 Design Concept Study, Village of Oak Creek to Sedona, Rimrock-Sedona Highway*, ADOT, 2002a

^a Assumes signalization

During construction, two-way traffic could not be maintained and pilot cars would be required. Routine maintenance or minor roadway improvements would also require the use of pilot cars. Any type of construction or maintenance activities would result in substantial traffic delays and be substantially more expensive because of the need for pilot cars and night operations. With a two-lane facility, there would be a higher potential for delayed emergency response (police, fire, and ambulance) due to traffic congestion, signalized intersection delays, and traffic incidents blocking traffic. There would be the potential for head-on and sideswipe accidents because the directional traffic would not be separated.

The VOC Alternative was eliminated from further consideration because without increasing the capacity of the existing roadway, the increase in traffic over the next 20 years would result in lower LOS and increased peak-hour congestion (LOS E or F) along the entire route than currently exists. Increased congestion would result in longer travel time and potential impairment to emergency vehicle response time. The number of accidents would continue to escalate with the continued increase in tourism, development, and population in the area. Because the VOC Alternative would not meet the purpose or the need of the project, it has been eliminated from further consideration.

D. No Action Alternative (rejected)

A No Action Alternative was considered in addition to build alternatives. No major new construction would occur within the project limits in this alternative. The No Action Alternative would include only minor safety improvements, routine maintenance activities, and pavement resurfacing. Without increasing the capacity of the existing roadway, the increase in traffic over the next twenty years would result in lower levels of service and peak-hour congestion (LOS E or F) along the entire route than currently exist. Increased congestion would result in longer travel time and potential impairment to emergency vehicle response time. The number of

accidents would continue to escalate with the area's continued increase in tourism, development, and population. The visual quality within the foreground area of the roadway would decrease because of the degradation of the vegetation and disturbance to the ground created by people continuing to park and access the National Forest lands in an unrestricted manner along SR 179. Pedestrian safety would not be addressed because of the lack of safe pull-out areas. Because the No Action Alternative would not meet the purpose or the need of the project, it has been eliminated from further consideration.

E. Build Alternatives Considered

All of the build alternatives have some common impacts. Roadway capacity would be increased and AASHTO guidelines would be met, thereby improving the level of service. All build alternatives would have scenic pull-outs located along the route. There would be temporary construction and some permanent impacts on existing public recreation facilities and riparian vegetation within the study area. In addition, bridge construction would create temporary, unavoidable impacts to Oak Creek, which is classified by the Arizona Department of Environmental Quality (ADEQ) as a Unique Water of Arizona. All the alternatives would require U.S. Army Corps of Engineers (COE) 404 permits and State 401 Water Quality Certifications. Scenic, cultural, physical, social, and economic impacts would vary depending on the specific alternative. The potential impacts and a brief description of each alternative considered are discussed below.

1. Limited Improvements Alternative (rejected)

In the 1992 *SR 179 Corridor Study*, consideration was given to constructing limited roadway improvements to SR 179. The limited improvements would retain the basic two-lane roadway while providing for construction of scenic pull-outs, installation of left-turn lanes at key intersections, horizontal and vertical curve modifications including straightening of the Roller Coaster area, and widening of roadway shoulders in selected areas. This alternative is an interim means of addressing current needs that would still be compatible with construction of the future full improvements that the design year traffic demand would require. Based on the growth along SR 179, updated traffic data and the number of collisions over the past 5 years, the limited improvements would not provide the needed capacity and would not improve the traffic operations of this route to the extent needed (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*, ADOT, 2002a). The limited improvements would not address any issues within the more urbanized area of Sedona because the improvements would end just north of the Poco Diablo resort (see Figure 16 on page 69). In addition, the National Forest lands would be impacted twice: once with the construction of the limited improvements and then again with the improvements ultimately needed to provide a LOS C in the design year 2025.

2. Three-Lane Alternative (rejected)

The Three-Lane Alternative would provide a continuous three-lane roadway throughout the project limits except in the Coconino National Forest, where the roadway would remain two lanes with no separation. The third lane would be striped as and function as a continuous two-way left-turn lane, except near major intersections where it would be striped as and function as an exclusive left turn lane for those intersections. Shoulders would be provided only within the two-lane section in the Coconino National Forest. The improvements would include construction of scenic pullouts, horizontal and vertical curve modifications, including straightening of the Roller Coaster area, to comply with sight distance requirements for the prescribed design speeds (same design speeds as with Alternative C), and right-turn lanes at signalized intersections. No construction would be required at Avenida de Piedras, Jacks Canyon Road, Bell Rock Boulevard, Back 'O Beyond Road, Chapel Road, Oak Creek Cliffs Drive or north of the Oak Creek bridge since these areas currently have an exclusive left-turn lane.

The Three-Lane Alternative could potentially reduce the occurrence of rear-end collisions by removing left-turn traffic from the through traffic. In addition, the incidence of head-on accidents could be reduced by the separation of opposing through traffic lanes in the developed areas. No such potential reduction would occur in the Coconino National Forest, where the roadway would remain two lanes with no separation.

The Three-Lane Alternative would not meet LOS C criteria (average signalized intersection delay at or less than 35 seconds) in year 2025 at Bell Rock Boulevard, Chapel Road, Schnebly Hill Road, or SR 89A.

The Three-Lane Alternative would have no curbs; therefore, ditches would be required to carry the highway runoff. The area of disturbance or construction footprint of the Three-Lane Alternative would be very close to the same area as Alternative C, except in the Coconino National Forest where the Alternative C footprint would be larger due to the divided highway and bifurcated alignment sections. In terms of meeting the purpose and need for the roadway—the return on investment (capacity and safety improvements versus the amount of disturbed area)—Alternative C is preferable.

The Three-Lane Alternative would not provide opportunities for traffic to overtake or pass slower moving vehicles because no passing would be permitted in the continuous two-way left-turn lane configuration. The two-lane section in the National Forest would allow very limited passing opportunities due to sight distance restrictions.

During construction of the Three-Lane Alternative, two-way traffic could not be maintained in most areas and pilot cars would be required. Maintenance of traffic would be particularly challenging in areas where horizontal or vertical alignment improvements would be constructed.

The Three-Lane Alternative would provide some increase in opportunity for emergency vehicles to use the two-way left-turn lane to bypass congestion or standing traffic; this opportunity would not exist where the standing traffic was in the left-turn lane as well as the through lane. Similarly, during some single-lane maintenance operations, traffic could be directed to use the center-turn lane to bypass the work area. For major maintenance or roadway improvements (with a two-lane closure) pilot cars would be required to maintain traffic. When compared with Alternative C, most construction and major maintenance activities would result in more substantial traffic delays and also would be more expensive because of the need for pilot cars and night operations with the Three-Lane Alternative.

The Three-Lane Alternative shares many of the deficiencies of the Limited Improvement and VOC Alternatives and was eliminated from further consideration because it does not meet the purpose and need for the project. It does not increase the through movement capacity of the existing roadway, which would be needed to accommodate the year 2025 projected traffic volumes at the LOS C or better. By year 2025, substantial peak hour congestion would result in longer travel time, more frequent queuing of traffic for extended periods, potential impairment to emergency vehicle response time, and potential increase in overall accident frequency. In addition, the Three-Lane Alternative would have a wider footprint than the VOC Alternative, due to the continuous left-turn lane.

3. Alternative A (rejected)

Alternative A was identified in the 1992 *SR 179 Corridor Study* as the recommended alternative within the existing corridor. This alternative consists of a two-lane rural roadway with a northbound climbing lane from MP 304.5 to MP 306.0 (south of Jacks Canyon Road), a five-lane urban roadway from MP 306.0 to MP 307.1 (located just north of Bell Rock Boulevard), a four-lane rural undivided roadway from MP 307.1 to MP 312.6 (Canyon Drive), and a five-lane urban roadway from MP 312.6 to MP 313.4 (SR 89A). Urban sections contain

curb and gutter while rural sections have 2.4-meter (8-foot) shoulders. In general, this alternative would widen the existing roadway in areas that comply with current AASHTO guidelines. In areas that would not comply, total roadway reconstruction would be undertaken. The estimated construction cost for Alternative A is \$22 million (in year 2002 dollars). The conceptual alignment for this alternative is shown in Figure 5 on page 25. This cross-section would allow for transit stops along the side of the road without interrupting the flow of traffic on the highway within the four-and five-lane sections.

Alternative A would remain on the existing centerline alignment and would maintain existing access and turning movements to businesses and residents adjacent to the highway. Approximately 4.0 hectares (9.8 acres) of right-of-way from private owners and 18.9 hectares (46.7 acres) of National Forest lands would be required to construct the alternative. There would be a loss of parking spaces at two churches and 11 businesses, and 11 building structures would be impacted. The scenic quality of the corridor would substantially decrease from MP 308 to MP 310 (ADOT 1992b). The recreational experience would be substantially changed from the existing condition because of the change in visual character along the route. Of the 37 comments received from the public that addressed preferences among the build alternatives, only one comment favored Alternative A. This alternative provides no separation between opposing lanes of traffic within the four-lane undivided section (78 percent of the length of SR 179 within the project limits). The non-separation of opposing traffic lanes, the effect on scenic quality, and the substantial change in recreation experience were factors that eliminated Alternative A from further consideration.

4. Alternative B (rejected)

After publication of the *SR 179 Corridor Study* in 1992, additional traffic count data for 1994 (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*, ADOT, October 1996) prompted ADOT to generate Alternative B. This alternative consists of a four-lane rural roadway with a raised median from MP 304.5 to MP 306.0 (south of Jacks Canyon Road), a four-lane urban roadway with raised median from MP 306.0 to MP 307.1 (north of Bell Rock Boulevard), a four-lane rural roadway with a raised median from MP 307.1 to MP 309.9 (located 0.3 kilometer [0.2 mile] south of Back 'O Beyond Road), a four-lane urban roadway with a raised median from MP 309.9 to MP 312.7, and a five-lane urban roadway from MP 312.7 to MP 313.4 (SR 89A). Urban sections contain curbs and gutters, while rural sections have 2.4-meter (8-foot) shoulders. Alternative B would reconstruct SR 179 to meet current ADOT and AASHTO criteria. The estimated construction cost for this alternative is \$31 million (in year 2002 dollars). The conceptual alignment for this alternative is shown in Figure 6 on page 26.

The raised medians would limit left-turning movements to fixed locations within the four-lane sections of the highway. These raised medians would affect residences and businesses with existing access to SR 179 by restricting or prohibiting left-turn access and therefore increasing travel time and causing longer travel routes. There would be two major beneficial impacts related to the presence of the raised medians in Alternative B. The raised medians with left-turn lanes would improve safety by reducing head-on and rear-end accidents and reducing conflicts with merging and turning movements. There would also be the opportunity for future landscaping of the medians, meeting the planning goals of the Village of Oak Creek and City of Sedona.

Due to the refinement of the roadway alignment, Alternative B would have less impact on adjacent properties than Alternative A. Approximately 5.6 hectares (13.9 acres) of right-of-way from private owners and 22 hectares (54.5 acres) of National Forest lands would be required. There would be loss of parking spaces at one church and ten businesses, and five building structures would be impacted. Similar to Alternative A, the scenic quality of the corridor would moderately decrease between the Village of Oak Creek and Bell Rock and substantially decrease from Bell Rock to Back 'O Beyond Road. The constant median width and wider roadway footprint

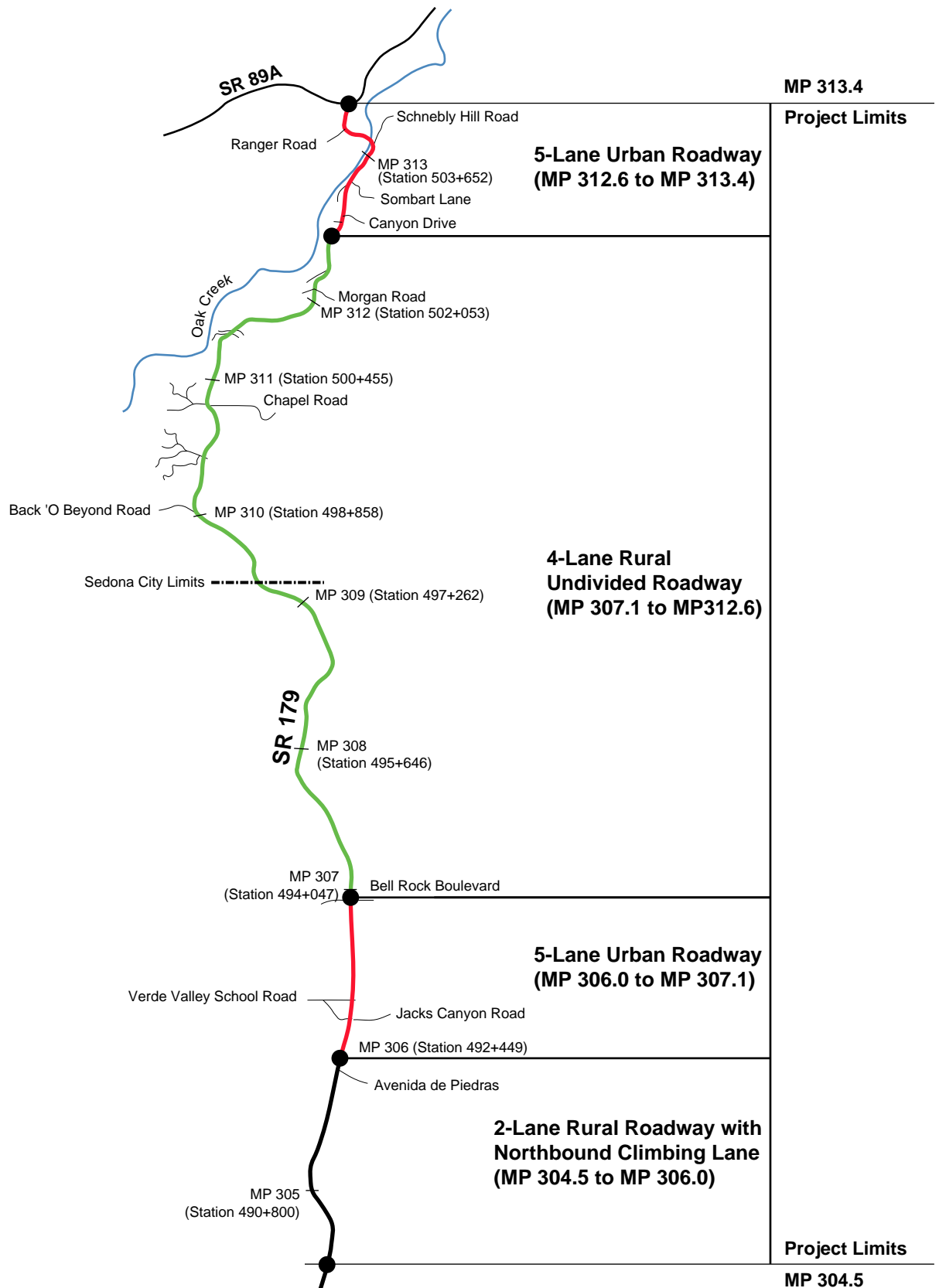


Figure 5. Alternative A



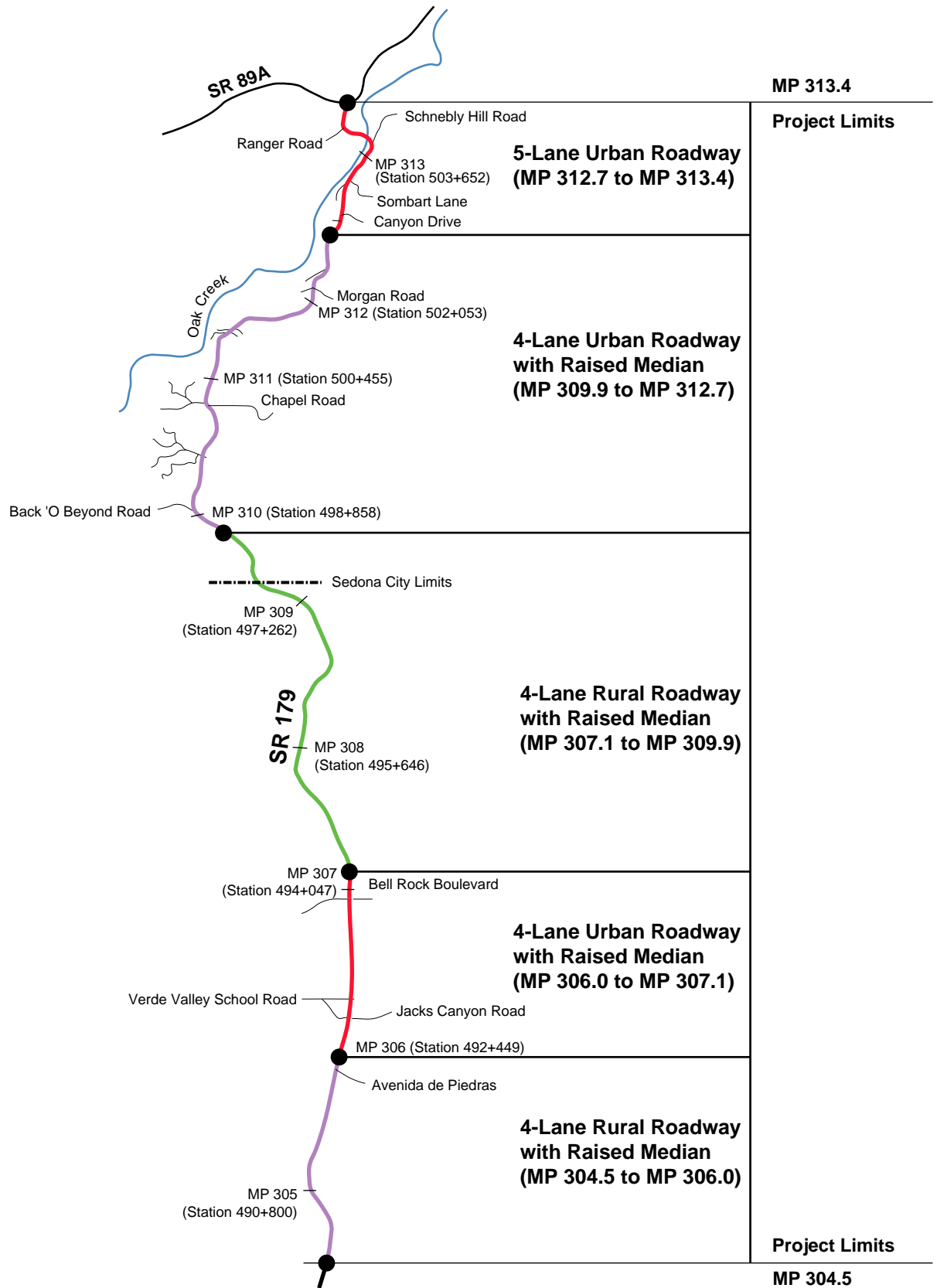


Figure 6. Alternative B



would create an obvious change from the existing visual character and reduce the scenic driving experience (ADOT 1992b). This cross-section would allow for transit stops along the side of the road without stopping the flow of traffic on the highway.

Alternative B was rejected because it would require disturbance to an 80-meter (262-foot) segment of the Red Rock Pathway, would encroach into Oak Creek, require rechannelization of Jacks Canyon, and would cause a greater magnitude of change in the visual quality of the area than would Alternative C.

5. Alternative C (selected)

Alternative C was developed as a result of collecting updated accident and traffic data (*Final Traffic Operational Analysis Report: SR 179 Design Concept Study*, ADOT, October 1996), obtaining plans of future development (from Yavapai and Coconino Counties, the Village of Oak Creek, the City of Sedona, and Coconino National Forest), and continuing coordination efforts with the affected agencies. This alternative will reconstruct SR 179 to meet current ADOT and AASHTO criteria with six exceptions (refer to page 34 for identification of design exceptions). Alternative C is composed of the following typical sections:

- A four-lane rural roadway with a raised median and outside shoulders from MP 304.5 to MP 305.9 (south of the Sedona Golf Resort entrance);
- A four-lane urban roadway with a raised median from MP 305.9 to MP 307.1 (north of Bell Rock Boulevard). Concrete sidewalks will be constructed on both sides of SR 179 from Ridge Trail Drive to the pull-outs at the National Forest Boundary, with exact limits to be determined during final design;
- A four-lane rural roadway with a raised median and outside shoulders from MP 307.1 to MP 307.2 (0.3 kilometer/0.2 mile north of Bell Rock Boulevard);
- A four-lane rural divided roadway with bifurcated (independent) alignments and inside and outside shoulders from MP 307.2 to MP 309.6 (0.8 kilometer/0.5 mile south of Back 'O Beyond Road);
- A four-lane rural roadway with a raised median and outside shoulders from MP 309.6 to MP 309.9 (0.3 kilometer/0.2 mile south of Back 'O Beyond Road);
- A four-lane urban roadway with a raised median from MP 309.9 to MP 310.1 (at Back 'O Beyond Road); and
- A five-lane urban roadway with intermittent sections of a 2.4-meter- (8-foot) wide curbed median from MP 310.1 to MP 313.4 (SR 89A).

Linking with the existing Bell Rock Pathway, a pedestrian path on the east side of SR 179 will be constructed to connect the Village of Oak Creek (MP 305.9) to Sedona (MP 313.4) and on both sides of SR 179 from Arrow Drive (MP 312.0) to SR 89A (MP 313.4).

A five-lane roadway consists of two travel lanes of traffic in each direction with a center two-way left-turn lane. The final roadway surface course will consist of 1.3-centimeter (0.5-inch)-thick rubber-modified porous asphalt friction course (AR-ACFC). The estimated construction cost for Alternative C is \$39 million in year 2002 dollars, with a total cost estimate of \$50 million. The conceptual alignment for Alternative C is shown in Figure 7 on page 28, and the preliminary roadway plans and typical sections are provided in Appendix C. Figure 8 on page 29 illustrates what the three roadway sections will typically look like in the study area.

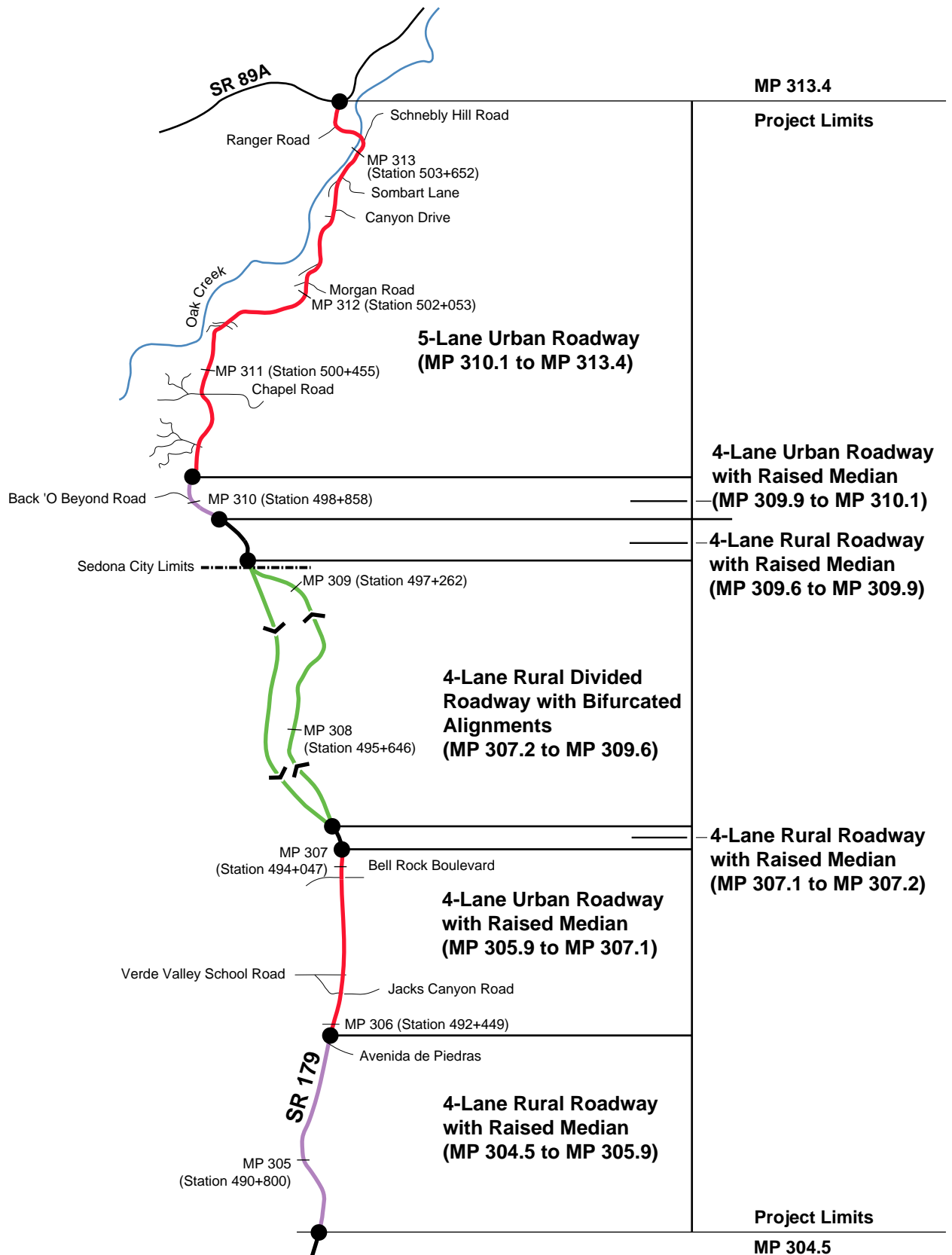


Figure 7. Alternative C (Selected Alternative)





5-Lane Urban Roadway



5-Lane Urban Roadway with Raised Median*



4-Lane Rural Roadway with Raised Median* and Shoulders

* Raised median allows for future landscaping by others

Figure 8. Typical roadway section photo-simulations

Bifurcation refers to the independent vertical and horizontal alignments of the directional travel lanes. The northbound and southbound lanes will be separated for a distance of approximately 4 kilometers (2.5 miles) between approximately Bell Rock Boulevard and Back 'O Beyond Road. Bifurcation is the primary difference between Alternatives B and C. Approximately 44.3 hectares (109.5 acres) of Coconino National Forest land will be needed along with 4.3 hectares (10.6 acres) of private land. The scenic quality for northbound travelers will decrease only moderately for Alternative C compared to substantially for Alternatives A and B. For southbound travelers, the scenic quality will improve moderately and offer new opportunities for scenic viewing not currently available. The visual character and recreational experience along the bifurcated section of the highway will be similar to existing two-lane roadway conditions. Highway travelers will not have to contend with oncoming traffic.

There are concerns about the potential impacts to the deer foraging area within the southbound alignment near Bell Rock Vista. However, the likelihood of vehicle accidents with deer will potentially be lower in the bifurcated area than on an undivided four-lane section because the large separation between travel lanes will provide cover and a safe zone for the wildlife. Similar to Alternative B, the raised medians will restrict left-turn movements to specific access points within the four-lane sections of the highway. This will affect residences and businesses with existing direct access to SR 179. However, there will be beneficial impacts related to the presence of the raised medians provided by Alternative C. Similar to Alternative B, the raised medians in the developed areas of the Village of Oak Creek and the City of Sedona will improve safety and meet the planning goals of the communities, but will also define access for residences and businesses. The four- or five-lane roadway cross-section will improve any future transit service by providing a free-flowing traffic lane adjacent to the median and a transit service in the lane adjacent to the side of the road. This cross-section will allow for transit stops along the side of the road without substantially interrupting the flow of traffic on the highway.

There will be loss of parking spaces at one church and eight businesses, and four buildings and one canopy structure will be impacted. Alternative C was identified as the selected alternative because it will have the least impact on scenic quality, visual character, and recreational experience as compared to Alternatives A and B.

6. Design Speed for Alternative C

The current design speed of SR 179 under Alternative C between MP 304.5 and MP 313.4 varies from 50 mph to 37 mph. AASHTO defines design speed as “the selected speed used to determine the various geometric features (curves, shoulders, etc.) of the roadway. Every effort should be made to use as high a design speed as practical to attain a desired degree of safety, mobility, and efficiency within the constraints of environmental quality, economics, aesthetics, and social or political impacts.” AASHTO defines posted speed as “limits set to approximate the 85th-percentile speed of traffic as determined by measuring the speeds of a sample of vehicles.” If the 85th-percentile speed is greater than the design speed, the posted speed would equal the design speed.

A context-sensitive design evaluation regarding design speed was undertaken to determine the magnitude of benefit if the design speed were reduced in different project areas. The three areas of potential benefit were the sections from MP 307.1 to MP 310.1, MP 310.1 to MP 312.0, and MP 312.0 to MP 313.4. A summary of each evaluation follows.

□ MP 307.1–MP 310.0

The design speed of the highway between the Village of Oak Creek (MP 307.1) and Back 'O Beyond Road (MP 310.1) was established at 50 mph based on the characteristics of the roadway and the speed studies performed by the City of Sedona. A design speed evaluation indicated that reducing the speed from 50 mph to 37 mph would allow the roadway to better fit the existing terrain and reduce

the area of disturbance, thereby reducing the impacts to scenic quality. The analysis also determined that a substantial reduction in the area of disturbance can be achieved, even designing under the higher design speed, if guardrails were installed on both sides of the roadway in some locations where cuts and fills offered the opportunity for steeper slopes and the revegetation of these slopes. Therefore, the revision in design speed for this stretch of the roadway was not considered appropriate.

□ MP 310.1–MP 312.0

Based on input from the City of Sedona, ADOT has agreed to modify the design speed from 50 mph to 40 mph between Back 'O Beyond Road (MP 310.1) and Arrow Drive (MP 312.0) to provide a context-sensitive design that will reduce the footprint of the road and the associated property impacts. This is appropriate and considered a benefit because this area is within the urbanized portions of Sedona and because the installation of guardrails will not provide any substantial benefit in terms of preserving natural vegetation.

□ MP 312.0–MP 313.4

The design speed for this section is 37 mph, which is a direct conversion from the metric 60 kilometers per hour. This could be revised to 35 mph during final design, when metric units are fully discarded. It was determined that the design speed from Arrow Drive (MP 312.0) to SR 89A (MP 313.4) will remain at 37 mph because no reduction in “footprint” could be obtained by lowering the design speed and because the installation of guardrail within the urbanized area of Sedona is inappropriate.

F. Scenic Pull-outs

The evaluation of alternative routes in the 1992 *SR 179 Corridor Study* included the selection and evaluation of 17 potential scenic pull-outs and viewpoints within the study area. The primary objectives for scenic pull-outs were to locate sites with the best scenic views within a reasonable distance of the travelway, provide photographic opportunities, reduce pedestrians' walking along and crossing the highway, and provide safe parking areas away from SR 179. As a result of the 1992 *SR 179 Corridor Study*, eight of the sites were selected for development and nine were eliminated from further consideration.

As part of the current DCR, additional selection objectives were identified that specified that the pull-outs will provide bus/recreational vehicle (RV) parking, the parking will be well off the highway and visually screened from the traveling public as much as feasible, and the sites will fit the terrain and enhance access to this portion of the Red Rock Pathways also known as the Bell Rock Trail (refer to Figure 30 on page 95 for location of trail). The Red Rock Pathways is an approximately 48-kilometer (30-mile) nonmotorized trail connecting the city of Sedona to Red Rock State Park and the Village of Oak Creek. An additional pull-out was added near MP 304.7 as part of the current DCR based on the recommendation by the Coconino National Forest. These nine pull-outs will provide safe locations for motorists to exit the highway to view and photograph the scenery along this portion of SR 179. Five pull-outs were considered on the northbound side of the highway, three on the southbound side, and one in the bifurcated section between northbound and southbound lanes. Figure 9 on page 32 shows the three pull-out locations; four potential future pull-out locations; and two recently constructed pull-outs, the North and South Bell Rock Pathway Trailheads. The four potential future pull-outs will not be built with the roadway improvements, but will be constructed when the Coconino National Forest determines that they are needed. The three pull-outs will be constructed with the roadway improvements accompanying the expansion of the parking area at the recently constructed North and South Bell Rock Pathway Trailheads, the last two designated pull-outs. The description of each location is included in Appendix D.

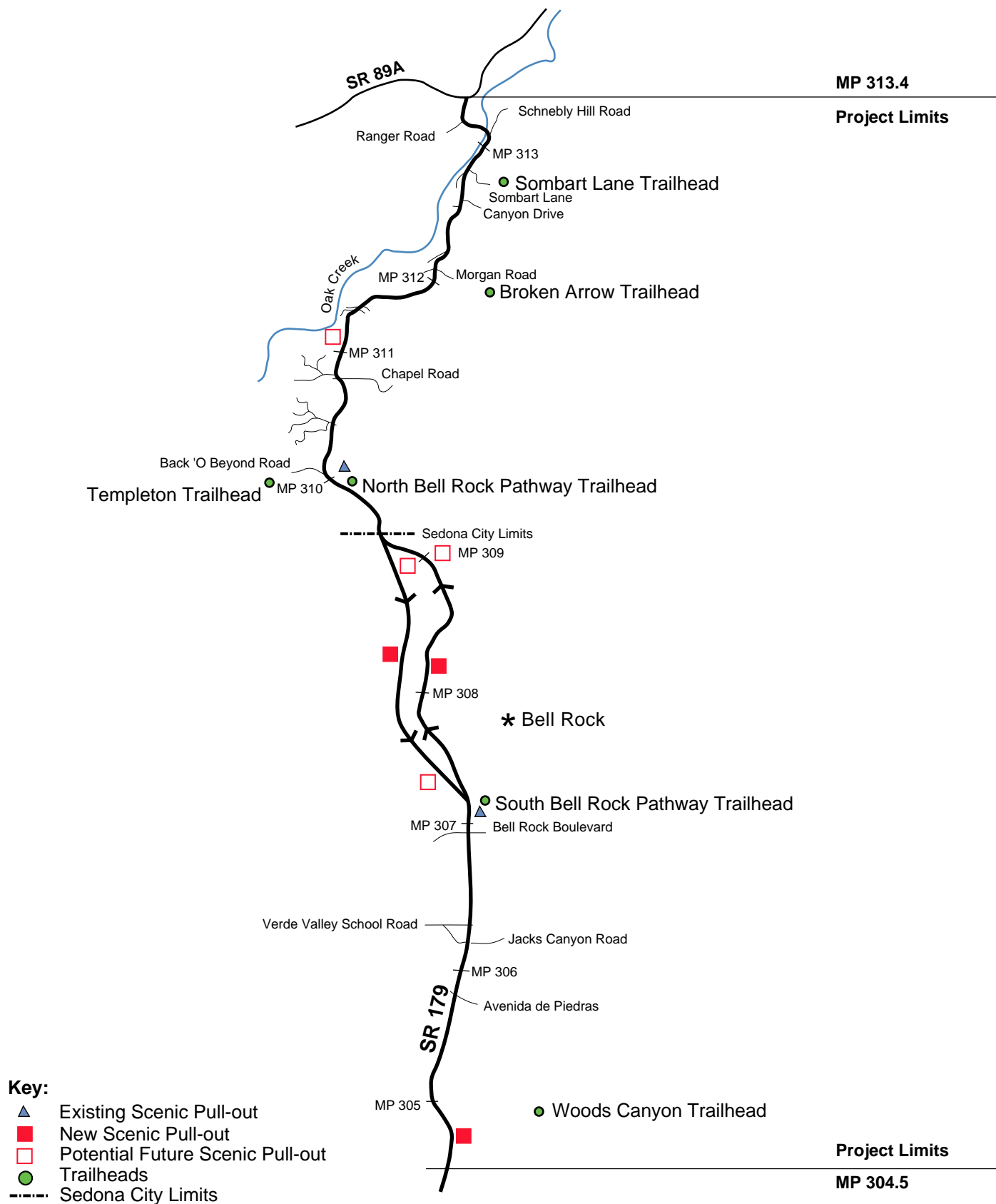


Figure 9. Scenic pull-out locations



All of the scenic pull-outs will be located on National Forest lands. ADOT will maintain pavement and drainage structures within the scenic pull-outs. The Coconino National Forest will be responsible for use management, signs, and maintenance of the restroom facility near MP 308.3 (Station 496+200) and other facilities at the scenic pull-outs. The Coconino National Forest will also be responsible for the design and construction of the restroom facility at the northbound scenic pull-out near MP 308.3 (Station 496+200). ADOT will fund the design and construction of the restroom facility at this scenic pull-out to replace the existing facility at Bell Rock Vista. Motorists using the pull-outs as a point to stop and take pictures or use the restroom facilities will not be charged a user's fee. According to new policies implemented by the Coconino National Forest, a fee will be required of visitors who park at the pull-outs with the intent of recreating on National Forest lands.

The pull-out in the bifurcated section and the pull-outs on the northbound side of SR 179 will generally consist of 24 parking spaces, including two spaces for RVs and two for tour buses. Tour bus parking will not be provided at the northbound scenic pull-out near MP 308.3 to reduce potential impacts to the Munds Mountain Wilderness Area. Each pull-out on the southbound side of SR 179 will require 17 spaces, including two spaces for RVs and two for buses. The pull-out located at the South Bell Rock Pathway Trailhead will accommodate 50 vehicles. Left turns from the pull-outs onto SR 179 will be prohibited to maintain satisfactory levels of service along the highway except from the scenic pull-outs in the median (MP 309.1) in the bifurcated section and at the South Bell Rock Pathway Trailhead pull-out (MP 307.3). The cross-over roadway to the potential future scenic pull-out located in the median (MP 309.1) will accommodate two-way traffic.

III. DESIGN FEATURES OF THE SELECTED ROADWAY ALTERNATIVE

The following information describes the roadway features of the Selected Alternative (Alternative C) for SR 179 including the roadway's horizontal and vertical alignments, access control, right-of-way requirements, drainage and floodplain considerations, traffic control, utilities, structures, and other features such as landscaping and walls. In addition, the implementation and construction schedule of the improvements is summarized below.

A. Horizontal and Vertical Alignments

In general, the horizontal alignment will follow the existing roadway except at the bifurcated section. The northbound roadway of the bifurcated section will be reconstructed generally following the existing roadway centerline. The southbound roadway will be constructed on a new alignment varying between 4.8 meters (15.7 feet) and 350 meters (1,148 feet) west of the existing roadway centerline.

The vertical and horizontal alignments will be designed to meet current ADOT and AASHTO criteria with six design exceptions that will not be corrected as part of the improvements. The design exceptions are summarized in Table 11. These exceptions are considered acceptable because the horizontal and vertical alignments will either widen the existing roadway or will match existing development on the east side of SR 179. The 0.3-kilometer (0.2-mile) section is completely urbanized with a speed limit of 25 mph, and multiple access points.

AASHTO defines design speed as "the selected speed used to determine the various geometric features (curves, shoulders, etc.) of the roadway. Every effort should be made to use as high a design speed as practical to attain a desired degree of safety, mobility, and efficiency within the constraints of environmental quality, economics, aesthetics, and social or political impacts." AASHTO defines posted speed as "limits set to approximate the 85th-percentile speed of traffic as determined by measuring the speeds of a sample of vehicles." If the 85th-percentile speed is greater than the design speed, the posted speed would equal the design speed.

Retaining the following existing deficiencies (or conditions) will minimize impacts in the commercially developed area between Oak Creek and the junction of SR 179 with SR 89A:

Table 11. Location and magnitude of design exceptions

MP	Station	Design Exception
313.2	504+012	Section of the roadway exceeds the recommended maximum grade by 1.3 percent
313.2	504+012	Vertical curve has stopping sight distance 10 meters (32.8 feet) less than recommended
313.3	504+176	Vertical curve has stopping sight distance 11 meters (36.1 feet) less than recommended
313.1	503+789	Horizontal curve has radius 125 meters (410.1 feet) less than recommended
313.3	504+052	Horizontal curve has radius 30 meters (98.4 feet) less than recommended
313.4	504+282	Horizontal curve has radius 50 meters (164.0 feet) less than recommended

Source: Final Location/Design Concept Report, SR 179: Village of Oak Creek - Sedona, ADOT, May 2000

B. Access Control

Existing access along the roadway is, for the most part, undefined and unrestricted. Few curbs exist, and motorists enter and leave the roadway at virtually any point. Implementation of an urban (curbed) roadway section will define points of ingress and egress along the highway and increase safety. The improvements will not eliminate direct access to SR 179 for businesses and residences that currently have direct access. However, some left-turn movements onto and from SR 179 will be restricted by the presence of raised medians. This restriction on left-turn movements is consistent with goals identified in the Transportation Section of the 1998 *Big Park Community Plan*. Future access to SR 179 will be allowed in accordance with local ordinances, Coconino National Forest requirements, and ADOT permit procedures. New right-of-way fencing will be installed in the nonurbanized areas along both sides of the highway and around the pull-outs when they are constructed.

C. Right-of-Way

New right-of-way/easement will be required for reconstruction of SR 179. Approximately 49 private land owners and 53 parcels will be affected by the improvements. The estimated right-of-way required for this project includes the potential acquisition of four building structures, one canopy structure, 44.3 hectares (109.5 acres) of National Forest land, and 4.3 hectares (10.6 acres) of private land. Of the four building structures, only one structure is a residence and the other three are commercial buildings. Additional land may be required for slope, temporary construction, and drainage easements, which will be determined in the next level of roadway design. Any temporary easements will be identified on the resource protection plans and will be restricted to the area identified under this EA. If areas outside of this EA's study area are required, the appropriate environmental analyses will be conducted prior to any ground-disturbing activities.

D. Drainage and Floodplain Considerations

New bridges and roadway encroachments into the designated floodplain will be designed to meet ADOT freeboard criteria for a 50-year storm event for protection of the highway from flooding. The drainage structures and roadway improvements will also meet FHWA guidelines for a 100-year storm event for protection of adjacent private properties, as required by Title 23 of the Code of Federal Regulations (CFR) Part 650A. Existing cross culverts that meet current ADOT standards will be incorporated into the widened roadway through extension of one or both sides of the roadway as necessary.

New storm drain systems will be required within the Village of Oak Creek and within the city of Sedona from the SR 89A intersection south for a distance of 5.6 kilometers (3.5 miles). Due to the rolling terrain within the city of Sedona, the storm drain system will be comprised of numerous small systems that discharge to local cross culverts. The storm drain system will be designed for the 10-year storm frequency for non-depressed roadways. Outfall structures will be established at existing culverts where possible. In the Village of Oak Creek, a new outfall to Jacks Canyon will be established to the east along Jacks Canyon Road.

E. Traffic Control

Traffic will be managed by detailed traffic control plans and by procedures and guidelines specified in the latest edition of *Arizona Department of Transportation Traffic Control Manual for Highway Construction and Maintenance* and Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, published

by the U.S. Department of Transportation, FHWA. Closure of SR 179 will be prohibited except for very short periods. Final construction sequencing/phasing plans will stipulate that construction activities that will disrupt traffic are to be performed during off-peak hours. Access to adjacent properties will be maintained during construction.

F. Utilities

All utilities along this portion of SR 179 will be affected to varying degrees. Existing utilities within the study area include Arizona Public Service (electrical), AT&T Corporation (telephone fiber optic), Qwest Communications (telephone), Citizens Utilities (gas), Big Park Water, Arizona Water, Mission Cable, Sedona Cable, Sedona Sewer, and Big Park Improvement District. Ongoing coordination efforts with the appropriate utility companies have occurred throughout the study process to reduce impacts. Adjustments to facilities will be coordinated with the utility owners during final design. Prior rights will be determined during final design to identify who is responsible for paying relocation costs. Utility companies with prior rights will be compensated according to ADOT policies and guidelines.

Future or existing utilities to be relocated may be placed within the new roadway easement within the National Forest. Coordination with the utility companies will be required to ensure that sufficient easement is provided to allow for maintenance of the utility facilities. Where retaining walls will be constructed to minimize disturbance, utilities may be allowed to be placed within or adjacent to the roadway as part of the roadway improvements. Coordination will be required among ADOT, the Coconino National Forest, and any applicable utility companies to allow utilities to be placed within the roadway easement as a secondary use to transportation.

G. Structures

A new bridge will be constructed on the new bifurcated southbound SR 179 roadway near MP 309.0 (Station 497+150). The existing bridge at Oak Creek located near MP 313.2 (Station 503+800) will be reconstructed and widened. Traffic will be maintained on the Oak Creek bridge during construction.

H. Other Features

1. Landscaping

Within the National Forest lands, the roadway medians will be planted with drought-tolerant native species such as agave and prickly-pear cactus, using densities similar to adjacent undisturbed areas. No trees will be planted in the median. The medians will not have a permanent irrigation system. ADOT will maintain the plantings within these medians. Medians within non-National Forest lands will be surfaced with crushed native rock material from the study area. Pipe sleeves will be placed at appropriate locations under the roadway for future irrigation systems that may be constructed by others.

2. Signalization and Directional Signs

Two new traffic signals will be installed on SR 179. These will be at Chapel Road located near MP 310.6 (Station 499+820) and Schnebly Hill Road located near MP 313.1 (Station 503+750). Near MP 313.4 (Station 504+250) at the intersection with SR 89A, an overhead directional sign may be constructed. ADOT will work

with the City of Sedona to design sign support systems that are “in character” with the urban area if traffic control structures are required as part of the improvements within the city limits.

3. Fencing and Guardrail

Fencing will consist of new wire game fence along the right-of-way/easement from approximately MP 304.5 (Station 490+091) to MP 306.1 (Station 492+640), and from MP 307.1 (Station 494+232) to MP 310.1 (Station 498+980). Pedestrian safety fencing will be installed on the new Oak Creek bridge located near MP 313.1 (Station 503+800). Fencing material at the scenic pull-outs will be wooden fences similar to those at the existing pull-outs. Existing guardrails will be replaced with weathering steel guardrail at appropriate locations throughout the SR 179 project limits.

4. Walls

Numerous retaining walls will be required to contain roadway fill, minimize cuts, reduce the number of residences and businesses impacted, and minimize impacts to Jacks Canyon and Oak Creek. Noise abatement measures will be constructed based on final noise analysis conducted during final design. Wall locations are shown on plan sheets in Appendix C.

5. Pedestrian Path

Linking with the existing Bell Rock Pathway, a pedestrian path on the east side of SR 179 will be constructed to connect the Village of Oak Creek (MP 305.9) to Sedona (MP 313.4) and on both sides of SR 179 from Arrow Drive (MP 312.0) to SR 89A (MP 313.4).

I. Needs-Based Implementation Plan and Construction Schedule

A needs-based implementation plan concept was derived from a facilitated meeting between ADOT and Sedona stakeholders. This corridor will utilize the EA, Selected Alternative C, as its baseline and overall concept plan, including the bifurcated alignments in the Coconino National Forest segment. This overall concept will be broken into various projects within the corridor. Each project’s implementation will be based on needs through a segment-by-segment evaluation.

ADOT's current Five-Year Highway Construction Program includes the design and construction of two segments of SR 179, the Village of Oak Creek to the north Forest Boundary (MP 310.03) and the north Forest Boundary (MP 310.03) to Sedona. ADOT will meet with the City of Sedona and other stakeholders to discuss the progressive implementation of the Selected Alternative once the DCR and EA have been completed.

IV. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following information describes the affected environment or existing conditions within the project limits and presents the potential effects of the project. Measures to avoid or minimize impacts have also been identified for each component of the environment and are summarized in the mitigation measures on pages viii through xxi of this document. For the purposes of this document, the east-west limits of the study area are graphically shown on the figures at approximately 0.8 kilometers (0.5 miles) on either side of the existing centerline of SR 179. The evaluation of resource impacts generally focused on the area within 20 meters (65.6 feet) in the urban areas and 35 meters (114.8 feet) on the National Forest lands on either side of the existing highway centerline. Scenic, drainage, floodplain, and the bifurcated roadway segment impacts extended beyond these limits.

The potential environmental impacts of the improvements were evaluated based on both the context of the effects on the project area and the intensity or severity of impacts as defined in the CEQ regulations. Table 14 at the end of this section summarizes the environmental impacts of the project actions.

A. Ownership, Jurisdiction, and Land Use

For the purposes of this assessment, land ownership is identified in terms of public or private ownership. Jurisdiction implies land use regulation authority. The ownership of land within the study area is split almost equally between public and private entities. Figure 10 on page 39 illustrates the land jurisdiction and ownership within the project limits.

All of the public land is under the ownership of the United States (U.S.) government and is administered by the U.S. Department of Agriculture within the Red Rock Ranger District of the Coconino National Forest. Amendment 12 of the *Coconino National Forest Land and Resource Management Plan* (Amended June 1998) identifies management goals for various resource elements including outdoor recreation, wildlife and fish, riparian, range, and transportation that are applicable to the new management areas. The study area lies within four new management areas that have been designated as part of the Sedona-Oak Creek Canyon ecosystem management strategy. These management areas are the Neighborwoods, Red Rock Frontcountry, Gateway, and Wilderness. Figure 11 on page 40 shows the location of these management areas.

Neighborwoods refer to areas where National Forest lands are adjacent to the urbanized land of the city of Sedona and the Village of Oak Creek. This management area emphasizes community partnerships for stewardship of the land. Appropriate uses within these areas include day-use activities such as wildlife viewing, easily accessible nonmotorized trail opportunities, and maintenance of a scenic corridor. In the Red Rock Frontcountry Management Area, an emphasis is placed on visitor orientation and interpretation to promote stewardship. The focus of the Gateway Management Area is to welcome visitors and provide a scenic corridor for people entering or leaving the red rock area on SR 179 and SR 89A. Management actions for the Gateway corridors include safe and convenient scenic turnouts with visitor information services and protection of the scenic roadside character. Munds Mountain Wilderness Area is located near the eastern boundary of the study area at MP 308.0 and MP 312.9 and is the only Wilderness area near the highway that will be addressed under the Wilderness Management Area strategy. Management actions for the Wilderness area include “efforts to reduce aircraft noise, develop a visitor permit system, improve trail marking and accelerate educational efforts at trailheads to inform visitors of the areas’ fragility and promote an understanding of Wilderness.”

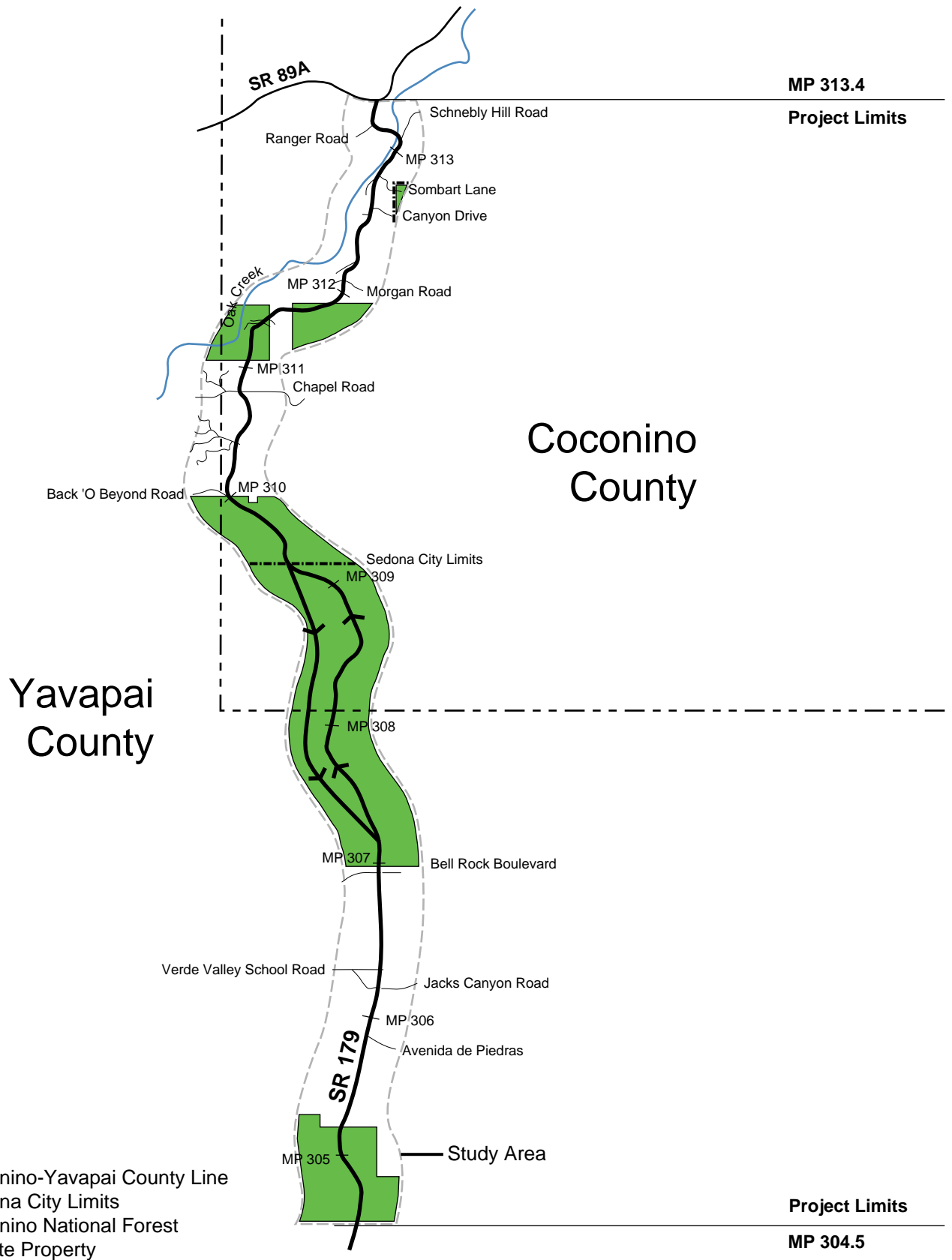


Figure 10. Land ownership/jurisdiction



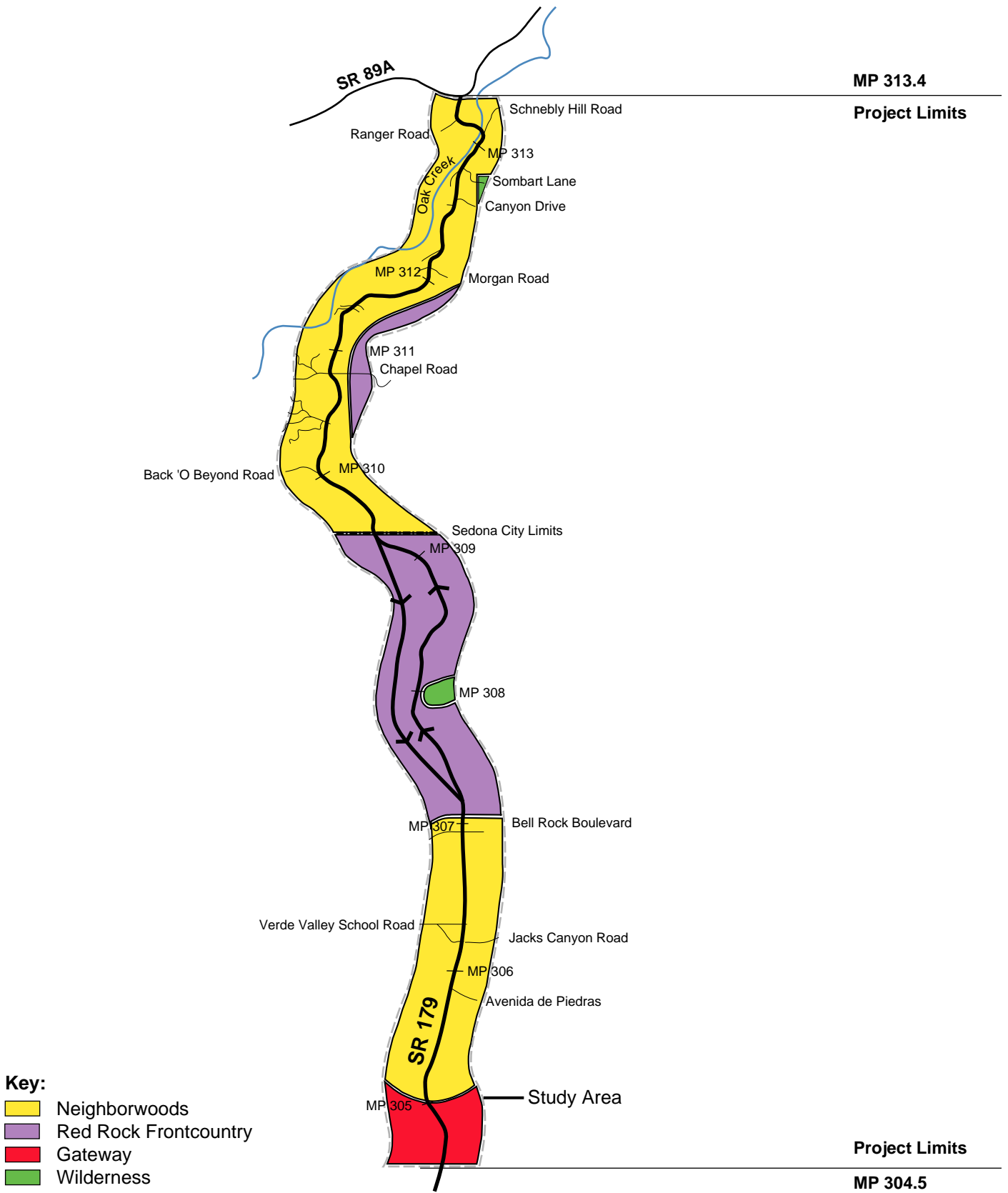


Figure 11. Sedona-Oak Creek Canyon Ecosystem Management Areas



The private land within the study area is under the jurisdiction of either Coconino or Yavapai Counties or the City of Sedona. Lands within Coconino County are under the jurisdiction and planning of the City of Sedona or the Coconino National Forest. Figure 12 on page 42 illustrates the future land use designations according to the study area's respective community plans. In the southern portion of the project area, the *Big Park Community Plan* (June 1998) of Yavapai County includes the Village of Oak Creek. The study area crosses through the Village of Oak Creek (Big Park Core Area), which is characterized by urbanized development patterns and represents the main population center of this planning area. Two commercial areas lie adjacent to the intersections of SR 179 with Bell Rock Boulevard and with Jacks Canyon and Verde Valley School Roads. These commercial areas contain a variety of commercial uses and tourist accommodations such as the Oak Creek Factory Outlets, Desert Quail Inn, Wild Toucan Restaurant, Bell Rock Inn, Artisan's Gallery, Circle K, Village Ace Hardware, Holiday Inn Express, and Mountain Dove Chiropractic Center. Within the Big Park Core Area, there are both single- and multiple-family residences; however, they have no direct access points from SR 179. Sedona Golf Resort, Canyon Mesa, and Las Piedras are large planned developments within the *Big Park Community Plan* and have a mixture of land uses such as retail, lodging, residential, and in some cases, golf courses. Each of these developments relies on SR 179 as its primary access.

Moving northward, land uses along SR 179 from the southern city limits of Sedona to SR 89A are a combination of Coconino National Forest, low- and medium-density single family residences and visitor-oriented commercial, retail, and resort uses, including galleries and curio shops. In addition to the Village of Oak Creek's plans, Figure 12 on page 42 also illustrates the future land use designations according to the *Sedona Community Plan* (June 1998). The Plan includes a variety of residential densities, general service/employment categories which include visitor based retail and services, and open space preservation/ conservation land uses. The City of Sedona has also prepared the *Uptown Creek Area Plan* (1993), which includes the area along SR 179 from Canyon Drive to SR 89A. With respect to SR 179, the *Uptown Creek Area Plan* focuses on pedestrian circulation and parking. Reflecting the continued growth trend in population and tourism, there are 562 units of hotel and timeshare resorts, over 18,435 square meters (198,437 square feet) of office and retail space, and 220 units of single family and townhome residences currently under construction or that have approved plans within the city limits of Sedona as of December 1998. The recent large developments directly accessed from SR 179 include the Back 'O Beyond Ranch, the expansion of Hillside Courtyard/Marketplace, and the proposed "Y" Project which is located immediately north of the SR 89A/SR 179 intersection.

There are limited public service facilities within the study area. Sedona Fire Department Station #3 is located in the Village of Oak Creek at MP 306.8. Big Park Community School is located west of SR 179 in the Village of Oak Creek, and school buses for Sedona-Oak Creek School District use SR 179 as one of their primary access routes. There are six designated school bus stops within the study area. The school bus stops are along SR 179 at Canyon Drive, San Miguel, Meadowlark, West Mallard, Juniper Trail, and Arrow Drive. A post office is also located in the Village of Oak Creek. Secondary schools, emergency care, and police facilities are provided in Sedona.

Short-term impacts to the existing land uses will result during project construction. People living or working in the immediate vicinity of the roadway will be exposed to increased levels of noise and dust due to the construction activities. Temporary traffic delays and decreased accessibility will occur for vehicles requiring access from SR 179 to business centers or individual residences. Existing access to properties will be maintained during construction. Construction activities could create a minor disruption to traffic. The contractor shall maintain traffic on the Oak Creek bridge during construction. The final design plans will include traffic control plans, which will address construction-related safety and access problems.

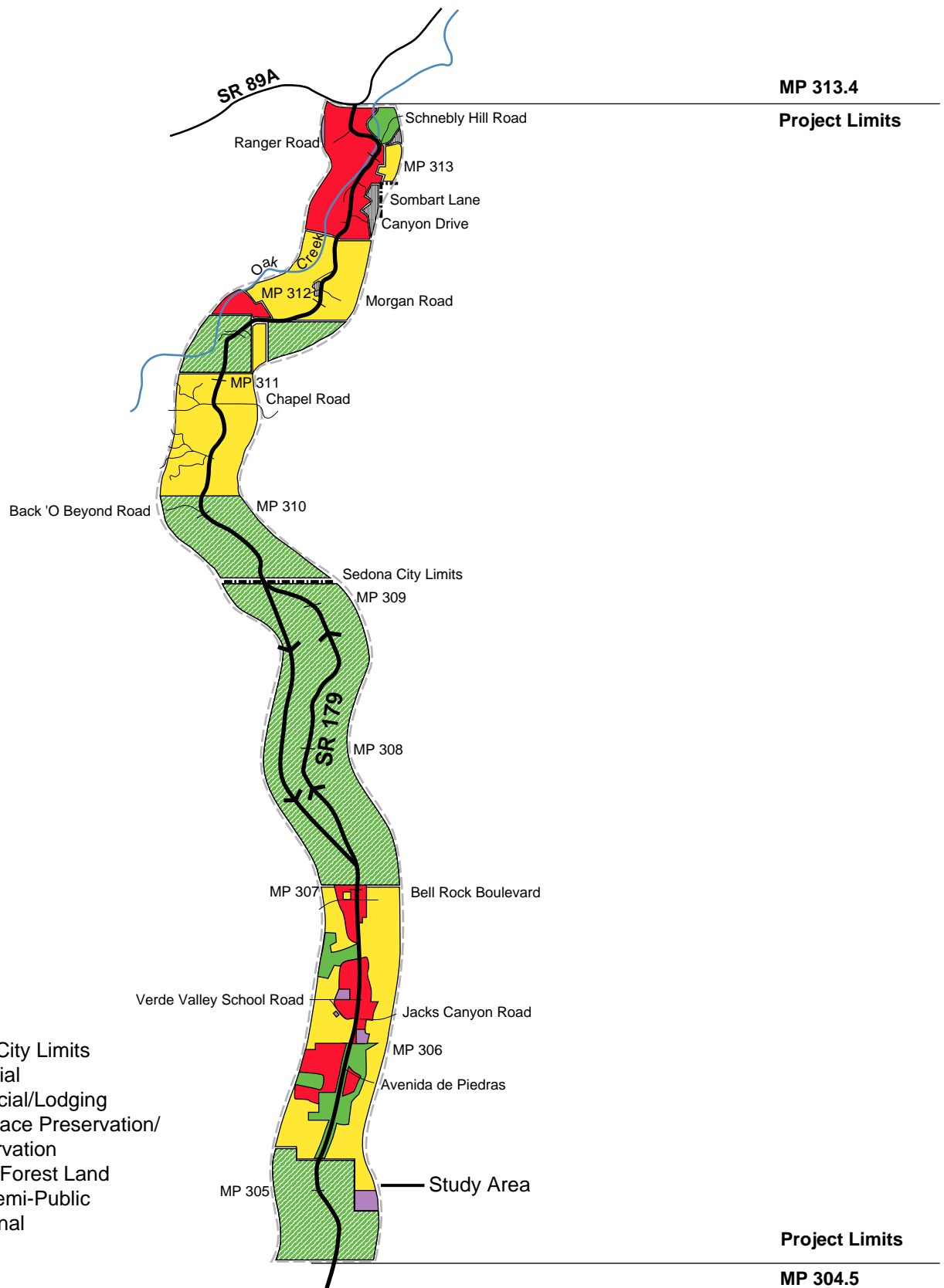


Figure 12. Future land use



New right-of-way and permanent easements will be required in areas on both sides of the highway. A total of approximately 48.6 hectares (120.1 acres) of new right-of-way and permanent easements will be required for the improvements, including the nine scenic pull-outs. The improvements will remove a total of 44.3 hectares (109.5 acres) of National Forest land from recreation and nontransportation public uses. This represents a removal of 0.006 percent of the National Forest lands in the Coconino National Forest from recreation and nontransportation uses. Of the 44.3 hectares (109.5 acres), 19.2 hectares (47.4 acres) will be required for the bifurcated portion of the highway and 24 hectares (59.4 acres) for the scenic pull-outs. The remaining 1.1 hectares (2.7 acres) of National Forest lands will be needed south of the Village of Oak Creek and near the Poco Diablo Resort in Sedona. Temporary construction easements are also anticipated, and will be determined during final design. Private property owners will be compensated at market value for land that is acquired for project right-of-way, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended in 1987.

All of the existing utilities along the corridor will be affected to varying degrees. Ongoing coordination efforts with the appropriate utility companies have occurred throughout the study process to reduce impacts. ADOT will coordinate with the utility companies on facility relocations during final design. Utility companies with prior rights will be compensated according to ADOT policies and guidelines. Existing utilities needing relocation will be moved to areas within the new right-of-way, while minimizing vegetation removal.

Overall, the long-term impacts of the improvements will provide the higher level of service needed to accommodate the existing and future development in the area. No long-term effects on land use are expected to occur as a result of the improvements. The additional travel lanes will add capacity to the route, and the separated roadway with median breaks will offer safer crossing and turning movement conditions. Improvement in the LOS will benefit existing uses along the route by reducing travel times. School and emergency vehicles will additionally benefit from the improved conditions. The improvements to SR 179 will also create and enhance recreational facilities by providing safe scenic pull-outs and parking areas for people wishing to gain access to National Forest lands. A pedestrian path on the east side of SR 179 linking with the existing Redrock Pathway will be constructed to connect the Village of Oak Creek (MP305.9) to Sedona (MP 313.4) and on both sides of SR 179 from Arrow Drive (MP 312.0) to SR 89A (MP 313.4).

B. Social and Economic Considerations

Based on historic population statistics, ADOT anticipates that the traffic growth projected in Table 2 would occur with or without roadway improvements, either those of the current project or with any other set of improvements. This is in large part due to the unique attraction and scenic beauty of Sedona and Oak Creek Canyon—this area would continue to attract visitors from all over the world, regardless of traffic conditions on SR 179. Also, population growth would continue to contribute to the growth of traffic in Sedona—the *Sedona Community Plan* (updated in 1998) indicates an average annual population growth rate of 2.6 percent between 1997 and 2010. Table 12 shows the historic population growth based on the census and historic and projected growth based on year-round and seasonal population estimates made by the Arizona Department of Economic Security and by the City of Sedona.

Table 12. Comparative population growth, 1990–2010

Area	1990 ^a	2000 ^a	Change	2010 ^b
Arizona	3,665,339	5,130,632	40.0%	5,760,100
Coconino County	96,591	116,320	20.4%	144,374
Yavapai County	107,714	167,517	55.5%	170,125
Sedona	7,720	10,192	32.0%	15,284 ^c

^a U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, April 1, 1990, and April 1, 2000; Summary File 1.

^b Arizona Department of Economic Security, Population Statistics Unit (1991/1997)

^c Sedona's population number includes year-round and seasonal population estimates; *Sedona Community Plan* (1998)

The primary components of the regional economy are recreation and tourism. According to the 1998 *Sedona Community Plan*, it is estimated that 3 to 4 million tourists visit the Sedona-Oak Creek area annually. The *Sedona Community Plan* suggests that this estimate of annual tourism translates into a rule-of-thumb: daily tourism visitation in Sedona currently approximately equals the local population. From the estimates in Table 12, if that approximation holds through 2010, Sedona would at that time average a population equivalent to that of a city of about 30,000 people. During peak tourist season, the number would be considerably higher.

The 1990 *Sedona Tourist Intercept Survey* reports that approximately 85 percent of all visitors arrive by car, and they, on average, stay one or two days. Sedona is also a day-trip destination for people from the Phoenix metropolitan area. Approximately 63 percent of the in-state visitors in 1995 were from the Phoenix metropolitan area. The primary reasons visitors come to the Sedona-Oak Creek area are to view and experience the scenic beauty of the area and shop at the art galleries and local craft stores.

According to 1996 sales tax collection data, the peak or high-season visitation is during April, May, June, and October, and the shoulder-season months were July, August, September, November, and December. In 1996, between \$138.2 and \$152.3 million of Sedona's taxable retail, lodging, and service industry expenditures sales were attributed to visitor spending. This represents over 60 percent of all taxable expenditures in these categories for Sedona.

Principal employment sectors in Coconino and Yavapai counties in 1997 were government, wholesale and retail trade, and services. Approximately 79 percent of the private sector employment in 1997 in Sedona was in retail trade and services. According to the 1990 Sedona Resident Survey, approximately 60 percent of all jobs within the city limits were held by individuals who lived outside the city. This trend is expected to continue since most new jobs will be in the retail and service sectors. The average income from these types of jobs is generally too low to support rental or home ownership within the city of Sedona. It is likely that affordable housing in the smaller communities like Cottonwood, Cornville, and other areas of Yavapai and Coconino Counties will continue to serve the employment center of Sedona. This growth in employment and the trend of service jobholders' living in smaller communities adjacent to Sedona will inevitably increase traffic on SR 89A and SR 179.

There are currently two grazing allotments within the study area. The allotment east of SR 179 and north of Bell Rock has been grazed seasonally by livestock, but will not be grazed for at least the next 10 years. This allotment is under life tenure and will not be reissued. The area south of the Village of Oak Creek along SR 179 is an active pasture and is used each year. The west side of SR 179 north of the Village of Oak Creek is also in an allotment but is not currently grazed, although it remains available in an active allotment. The contractor

shall install right-of-way fencing on National Forest lands as a first phase of construction to keep cattle from accessing the highway and to limit off-road vehicular access.

Short-term social and economic impacts will occur during construction of the project. The specific construction sequencing and duration will be determined during final design and included in the construction documents prepared for the contractor. During the design phase, ADOT will evaluate working during the evening hours, the timing of the construction (avoiding peak tourism season), and restricting construction to the weekdays. ADOT will work with the Big Park Regional Coordinating Council, the Village of Oak Creek, the City of Sedona's Citizens Advisory Committee, and other appropriate organizations during the final engineering design process to address concerns related to construction work scheduling and aesthetic design issues. The segment of the roadway between MP 307.2 to MP 309.6 will be built with minimal disruption to the traveling public because the southbound travel lanes will be physically separated from the existing roadway alignment. Once the new southbound travel lanes are completed, the traffic will be shifted from the existing roadway to the new roadway for construction of the northbound travel lanes. The segment between MP 309.6 to MP 313.4 is anticipated to take 18 to 24 months to construct, including utility relocation.

The contractor shall notify the public of the start of construction by placing notices in local newspapers 14 calendar days prior to the beginning of construction activities affecting traffic flow or access. The contractor shall also notify emergency services such as police and fire departments before construction activities begin as well as maintain continued coordination throughout construction.

During construction, access to permitted driveways and side roads will be maintained at all times along SR 179. Except for the very brief time required to protect the traveling public, such as for the movement of heavy equipment, the roadway will not be shut down during construction. One side of a driveway will be constructed at a time in order to maintain access during driveway reconstruction.

There will be some related economic impacts to the existing retail businesses within the project limits during construction. The economic impacts are not considered substantial for several reasons: 1) the roadway will not be closed to motorists, 2) access to all business and residential properties will be maintained, 3) access into the Sedona/Oak Creek area will continue on SR 89A from Cottonwood and through Oak Creek Canyon, and 4) standard public information on the construction schedule will provide clear and proper signage. In addition, some workers involved in the construction will likely purchase food and other commodities and generate income and revenues within Sedona and the Village of Oak Creek.

The majority of the long-term changes created by the action are related to vehicular access into the commercial areas. Individual driveways will replace the numerous informal access points that connect to SR 179. The raised median will limit left-turn movements to specific areas along the route. Approximately 49 private land owners and 53 parcels will be affected by the improvements. Parking areas for several businesses and for one church will be reduced. The shopping center with the Artisan's Gallery (MP 307.0) in the Village of Oak Creek will lose three parking spaces or 8 percent of the total number of existing spaces with the installation of a new driveway. Approximately five parking spaces or 10 percent of the total number of spaces at the Saint Luke's Episcopal Church (MP 310.4), 11 parking spaces or 31 percent of the total number of spaces at the commercial center on the west side of SR 179 at MP 313.3, and one parking space or 50 percent of the total number of spaces at the Chevron Service Station (MP 313.4) will be eliminated. Within ADOT's existing right-of-way adjacent to the Center for the New Age (MP 313.1), an area currently used for parking will be eliminated. The Center for the New Age will have available parking within its property boundary and their business will still be viable once the parking with ADOT's right-of-way is removed. One residence on the west side of SR 179 at MP 310.3 and four businesses will be structurally impacted. The affected businesses include The Inn on Oak

Creek (MP 312.9), Bell Rock Realty (MP 313.3), Flags, Kites & Fun (MP 313.3), and the canopy and one island of pumps at the Chevron Station (MP 313.4).

In addition to these existing four businesses and one residence, approximately 46 other private land owners within the study area will be affected by the loss of property adjacent to SR 179 for new right-of-way. Property owners will be compensated at market value for property acquired for project right-of-way in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended in 1987. Replacement housing will meet the requirements of 49 CFR § 24 and of the Ariz. Rev. Stat. Ann. § 28-1841, as contained in the 1995–1996 edition of the Arizona Criminal and Traffic Law Manual.

The placement of medians in the highway will create an increase in travel distance for those travelers who are unable to access businesses or scenic pull-outs because the median forces them to travel out of their way before they can turn around. In addition, businesses in the Village of Oak Creek and Sedona that rely on drop-in patrons in addition to local customers for a portion of their business are more likely to experience a loss in revenue than other businesses that are destination businesses. These impacts are not considered to be substantial and are mitigated by the improved LOS and greater capacity of the highway. While the median may impede direct access to some businesses for motorists, this will be offset by the greater number of motorists who can more easily travel through the retail areas. The locations of the median breaks have been coordinated with the fire and police departments. The medians will not have any impact on emergency response time based on discussions with City and County representatives. In addition, the raised medians will provide the opportunity for landscaping to improve the aesthetics of the roadway by providing color, a variety of shapes and forms, and reducing the expanse of the roadway asphalt. The Village of Oak Creek Association requested that raised medians be placed throughout the Village for these aesthetic reasons. Sedona's *Uptown Creek Area Plan* also calls for landscaped medians to enhance the city's retail center and reduce the visual scale of the highway in a pedestrian environment.

In conclusion, there will be short-term impacts during construction to motorists and business owners because of the inconvenience caused by typical slowing of traffic in construction zones. Long-term impacts will result from changes to vehicular access and acquisition of property. Once the roadway improvements are in place, tourists and local residents and businesses will benefit by the more efficient and effective traffic operations along SR 179.

C. Title VI of the Civil Rights Act of 1964/Environmental Justice

Under Title VI of the Civil Rights Act of 1964, federal agencies are required to ensure that no person is excluded from participation in, denied benefits of, or subjected to discrimination under any program or activity receiving federal financial assistance on the grounds of race, color, religion, national origin, sex, age, or disability. In addition, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994, requires federal agencies to identify and address, as appropriate, disproportionately high and adverse effects on minority and low-income populations.

According to the Arizona Department of Economic Security, there are seven 2000 Census blocks (four in Coconino County and three in Yavapai County) that SR 179 crosses. The characteristics of minority and low-income populations of the seven 2000 Census blocks that encompass the SR 179 corridor are listed in Table 13 and are compared to the statistics for Coconino and Yavapai Counties. The total population of the seven 2000 Census blocks represents 4.1 percent of the total population of the two counties.

Table 13. 2000 population characteristics

Population Characteristics	Yavapai County		Coconino County		City of Sedona (percentage)
	SR 179 Corridor (percentage)	Yavapai County (percentage)	SR 179 Corridor (percentage)	Coconino County (percentage)	
White alone	91.8%	91.9%	95.5%	63.4%	92.7%
Black or African American alone	0.3	0.3	2.0	1.2	1.1
Asian alone	0.9	0.5	0.2	0.8	0.9
American Indian and Alaska Native alone	1.9	1.6	0.3	28.2	0.6
Native Hawaiian and other Pacific Islander	0.0	0.0	0.0	0.2	0.0
Some other race alone	3.9	3.6	1.3	4.0	3.8
Two or more races	1.2	2.2	0.7	2.3	0.8
Hispanic ^a or Latino	6.3	9.7	5.8	10.9	7.8
Persons 18 Years and over Below 1999 Poverty Income Level ^b	8.1	8.4	7.8	11.7	8.1
Female head of household ^c	31.5	26.0	31.1	27.4	31.9
60 Years and older	36.1	28.9	37.0	10.5	33.9
Disabled ^d	17.8	21.9	16.2	16.3	16.8

Source: Arizona Department of Economic Security; U.S. Department of Commerce, Bureau of the Census, 2000 Census of Population and Housing

^a Hispanic refers to ethnicity and is derived from the total population and not as a separate race.

^b The Census Bureau uses a set of money income thresholds that vary by family size and composition to detect who is poor. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being "below the poverty level."

^c A female who is the person, or one of the people, in whose name the home is owned, being bought, or rented. This female may live with one or more people related to her by birth, marriage, or adoption. She may also live alone or with nonrelatives only.

^d Disabled means a person with a long-lasting physical, mental, or emotional condition.

There are no known minority neighborhoods within the SR 179 highway corridor. Any minority-owned residences and businesses that may exist along the project route will experience temporary impacts such as degradations in air quality, increases in noise levels, and reduced property accessibility. When the project is completed, these same groups will experience long-term benefit from decreased travel times as compared to the existing conditions. Because the roadway follows the existing alignment through the developed areas of the highway, temporary impacts will be experienced by all segments of the population; therefore, no segment of the population is disproportionately affected.

Measures have been employed during the roadway planning to minimize residential acquisitions, and the roadway improvements will benefit all populations. Based on the assessed value of the property, it is unlikely that the people living in the one eliminated residence are considered to be below the poverty level. Comparable residential housing units are available in the study area for the one affected residence. The action will not have a disproportionately adverse effect, either direct or indirect, on minority populations, low-income, elderly, or disabled persons within the study area. The improvements have been developed in accordance with the Civil Rights Act of 1964 (Title VI), as amended by the Civil Rights Act of 1968 (Title VIII), and conform to the requirements of the Americans with Disabilities Act of 1990.

D. Cultural Resources

A series of cultural resource surveys was undertaken within the study area between January 1994 and March 1997. Five cultural sites were recorded within the study area and have been determined to be potentially eligible or eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion (d), pursuant to 36 CFR § 800. The regulations state that resources are eligible that “possess integrity of location, design, setting, materials, workmanship, feeling, and association and (d) that have yielded or may likely yield information important in history or prehistory.”

Consultation has been completed between the Coconino National Forest and FHWA. Consultation also took place with the various interested Tribes; a list of the contacts and dates of contact for tribal consultation can be found in Appendix E. Decisions have been made regarding project impacts to project-related pull-outs, where archaeological testing has been completed to determine the extent of potential impacts. Consultation among FHWA, ADOT, the Coconino National Forest, and the State Historic Preservation Office (SHPO) has been completed regarding site eligibility and the nature and extent of potential impacts. Of the five sites identified, all were determined to be artifact scatters, mostly surficial in nature, with little or no evidence of features, and having a minimal data content. Clearance has been approved by SHPO and the Forest Supervisor. A copy of the clearance is included in Appendix E.

According to Section 107.05 of ADOT *Standard Specifications for Road and Bridge Construction* (2000 Edition), if previously unidentified cultural resources are discovered during construction, the contractor shall stop work immediately at the location, take all reasonable steps to secure the preservation of those features, and notify the ADOT Engineer. The ADOT Engineer will, in turn, notify the appropriate agency(ies) to evaluate the importance of the resources.

The five cultural sites within the study limits were further investigated and found not to be eligible for the NRHP; therefore, there will be no impact to known cultural resources.

E. Section 4(f) Resources

Section 4(f) of the U.S. Department of Transportation Act of 1966 states that the FHWA “may approve a transportation program or project requiring publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance, or land of a historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if there is no prudent or feasible alternative to using that land and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.” (49 United States Code [U.S.C.] 303)

A “use” of a Section 4(f) resource, as defined as in 23 CFR § 771.135 (p) occurs 1) when land is permanently incorporated into a transportation facility; 2) when there is a temporary occupancy of land that is adverse in terms of the statute’s preservationist purposes; or 3) when there is a constructive use of land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from the Section 4(f) resources, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

- the projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by Section 4(f);
- the proximity of the project substantially impairs aesthetic features or attributes of a resource protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the resource. An example of such an effect will be the location of a transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a park or historic site which derives its value in substantial part due to its setting; and/or
- the project results in a restriction on access which substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

National Forest lands are generally considered multi-purpose land (e.g., grazing, trail maintenance, and timber harvesting access roads). Because of this multiple-use status, Section 4(f) does not apply to all lands within a National Forest, according to 23 CFR § 771.135(d).

Section 4(f) does apply to four recreation facilities either crossing or located within the study area on National Forest lands. The Bell Rock Pathway Trailheads (both north and south trailheads), Bell Rock Pathway, H. T. Trail, and Templeton Trail are considered to be Section 4(f) resources located within the study area (Figure 13 on page 50). The trail information is based on the *Red Rock Pathways Master Trail Plan* (part of the City of Sedona’s *Trails and Urban Pathways Plan*), and information from the Coconino National Forest. Red Rock Pathways is a system of recreational paths and trails designed to connect the Village of Oak Creek, Sedona, and Red Rock State Park in a loop. Each of the public recreation facilities is described below along with an evaluation of the potential direct and proximity impacts, a discussion of any alternatives that will avoid the resource, and an identification of any measures to minimize harm.

One other designated recreation facility is accessed from SR 179. The Chavez Crossing Group Campground is a Coconino National Forest facility located adjacent to the highway corridor. Improvements to SR 179 will not have actual or “constructive use” impacts on the group campground. Additionally, SR 179 roadway improvements will not have adverse proximity impacts on this Section 4(f) property. Noise levels and aesthetic features or attributes at the group campground will not be affected because these recreation facilities are located more than 0.25 mile away from SR 179. Access to this recreation facility will be maintained during construction. According to 23 CFR § 771.135(p)(1)(2)(3), there will not be a “use” of Chavez Crossing Group Campground by the construction of roadway improvements.

Oak Creek was designated as a Unique Water by the Arizona Water Quality Control Council because it is considered to have exceptional recreational and ecological importance. Segments of the creek are within designated public recreation facilities such as Red Rock and Slide Rock State Parks. However, the portion of Oak Creek within the study area is not designated as a public recreation facility. Therefore, no further Section 4(f) resource evaluation will be required.

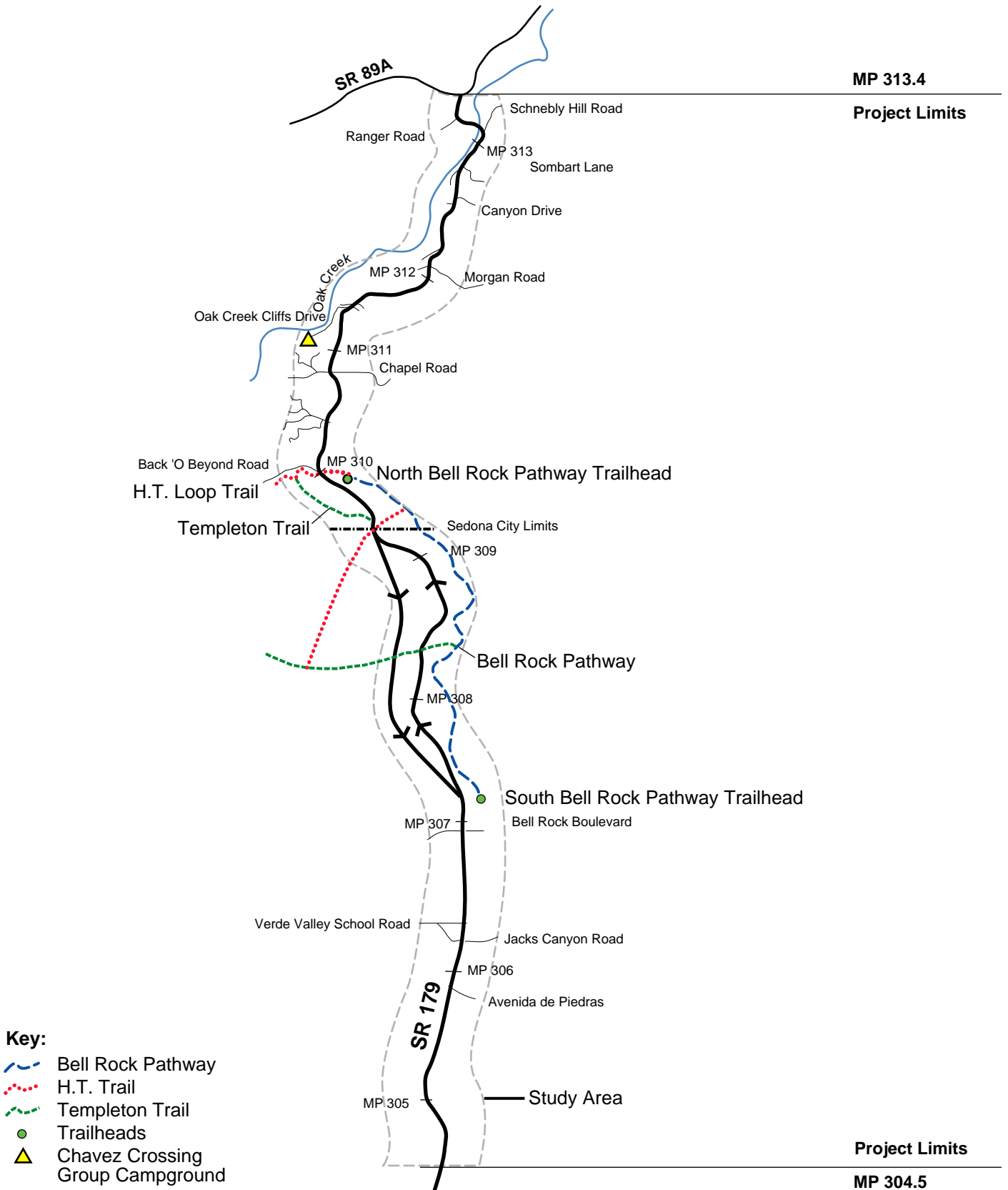


Figure 13. Section 4(f) Resources



1. Bell Rock Pathway Trailheads (both north and south trailheads)

The Coconino National Forest has recently constructed two trailheads at the north and south ends of the Bell Rock Pathway near MP 307.3 and MP 309.9. The planning of trailheads was done in close coordination with ADOT and its roadway improvements study team. The trailheads are located at two of the nine scenic pull-outs planned along SR 179. An information kiosk, right- and left-turn lanes off SR 179, and a small parking area have been constructed by the Coconino National Forest at each trailhead. ADOT will be expanding the parking areas for these trailheads/scenic pull-outs as part of the roadway improvements at the request of the Coconino National Forest. In addition, the left-turn movements out of the South Bell Rock Pathway Trailhead will be permitted.

There will be a temporary occupancy of the land of the two Bell Rock Pathway Trailheads while the parking area is being expanded. The two facilities will not be accessible during the expansion process, estimated to take up to four weeks. The temporary occupancy of the two trailheads is not considered adverse in terms of Section 4(f)'s preservationist purposes. After the construction activities are completed, the facilities will not be impaired in any way. Not expanding the parking area would avoid the temporary impacts to the existing trailheads along the Bell Rock Pathway. However, through personal communication with staff (Judy Adams, Coconino National Forest, June 1998), the expansion of the parking area is considered to be a beneficial improvement that outweighs the temporary access restrictions. The size of the parking areas was designed to accommodate the projected need for safe pull-out areas and for trailhead user needs. Undersizing the parking areas will result in people parking along the roadway and creating safety problems for vehicles and pedestrians. To minimize impact to these two Section 4(f) resources, expansion of the parking areas at the two Bell Rock Pathway Trailheads (MP 307.3 and MP 309.9) shall not be done at the same time. Construction activities at the trailheads/scenic pull-outs shall take place between November 1 and April 1, the off-peak use period. Information signs shall be placed along SR 179 to inform people of the closure of the trailheads/scenic pull-outs.

The temporary occupancy of the Section 4(f) resource will be minimal. Bell Rock Pathway will not be impacted by the expansion of the two Bell Rock Trailheads. The impacts to the Bell Rock Trailheads will be for only the length of time required for the construction of the additional parking area and not for the duration of construction for the entire project. The magnitude of impact to the Section 4(f) resource will be minor because the improvements will consist of expanding the existing parking area. The land will remain under the management of the Coconino National Forest once construction is completed and will be fully restored to preconstruction conditions, with no permanent interference with the purpose of the Section 4(f) resource. No permanent adverse physical impacts are anticipated, and the use of the Bell Rock Pathway will continue during construction. The Coconino National Forest is a cooperating agency on the EA and has agreed that the temporary occupancy of the Section 4(f) resource is minimal. Therefore, there is no actual "use" or "constructive use" of either trailhead as defined in 23 CFR § 771.135(p)(1)(2)(3).

2. Bell Rock Pathway

Bell Rock Pathway is a main segment of the greater Red Rock Pathways that will connect the city of Sedona to the Village of Oak Creek. The 5.5-kilometer (3.4-mile) Bell Rock Pathway has recently been completed and parallels a substantial portion of SR 179. The Bell Rock Pathway alignment was designed in coordination with ADOT's roadway and scenic pull-out planning efforts. Members of the Red Rock Pathways Committee were represented on the steering committee. Almost all of the Bell Rock Pathway is screened from the highway by either vegetation or landform. SR 179 is currently visible for short durations at several locations from the trail. The existing roadway does not notably lower the overall scenic quality of the views from the trail. In general, the northbound travel lanes will follow the existing highway alignment. The southbound travel lanes will not be

visible from the Pathway except for a short distance near the north Bell Rock Pathway Trailhead. Therefore, there will be no impact to the overall scenic quality of the views from the trail.

There will be direct beneficial impacts to the Bell Rock Pathway from the roadway improvements. The scenic pull-out at MP 308.3 and the potential future pull-out at MP 309.2 could also be used as additional trailheads for the Bell Rock Pathway. In addition, restroom facilities will be provided at the scenic pull-out at MP 308.3. In terms of proximity impacts, there will be no permanent access restrictions to the Bell Rock Pathway created by the roadway or scenic pull-out improvements.

Because of the projected increase in traffic volume over the next 20 years, overall noise generation in the vicinity of the highway will increase by two to three decibels. Based on the noise analysis, the Bell Rock Pathway is already near the existing highway and subject to noise intrusion. In order for a constructive use to occur for noise, the threshold of 67 A-weighted sound level in decibels (dBA) must be exceeded. The projected noise increase will be below the threshold level of 67 dBA. Temporary noise impacts will be created during construction.

To minimize impacts to the Section 4(f) resource, the majority of the construction activities will be conducted during weekdays and not on the weekends or holidays when there is a higher volume of trail use. Because the highway is currently near the Bell Rock Pathway, the visual setting will not notably change, access to the Bell Rock Pathway will be improved, and predicted noise levels will be below the threshold of 67 dBA. Therefore, there is no actual “use” or “constructive use” of the Bell Rock Pathway as defined in 23 CFR § 771.135(p)(1)(2)(3).

3. H. T. Trail

The H. T. Trail is a portion of trail loop that will eventually form an entire circle around the city of Sedona. Currently, it is composed of many different existing trail segments and will require a few additional segments to complete the loop. The *Red Rock Pathways* (1994) and the City's *Trails and Urban Pathways Plans* show the approximately 37-kilometer (23-mile) long City Perimeter Loop Trail/H. T. Trail crossing under SR 179 through an existing concrete box culvert near MP 309.9. The box culvert is considered part of the trail. The segment of the City Perimeter Loop Trail on either side of the highway is a designated Coconino National Forest trail known as the H. T. Trail.

The roadway improvements will not result in any substantive proximity impacts and will not interfere with the intended use, integrity, and function of the trail once completed. The culvert crossing under SR 179 is a benefit to trail users and will provide them with continuous access along the segment of the trail without having to cross the state highway at-grade. There will be a temporary occupancy of the land at the crossing of the H. T. Trail under SR 179 during the extension of the existing box culvert. It is anticipated that the culvert extension construction will take approximately three months. The culvert extension construction will impact 40 meters (131.2 feet) or 0.1 percent of the trail. There are no prudent or feasible alternatives to avoiding the construction of the new box culvert under SR 179. Construction of a temporary pedestrian overpass will create more disturbance to the land, substantially lower the visual quality and character of the setting, and cost approximately \$200,000. Because of the linear nature of both the drainage and roadway, there are no other roadway alignments that will avoid the drainage that the H. T. Trail uses, unless the highway was routed completely away from the existing highway corridor. Environmental consequences created by a new highway or trail alignment would potentially include impacts to wildlife habitats, degradation of inherent scenic quality, and disturbance to cultural resource features.

To minimize impact, temporary signs and flashing lights will be placed at the H. T. Trail culvert near MP 309.9 to warn motorists of pedestrians crossing the highway. Signs will be posted at the Templeton and North Bell Rock Pathway trailheads alerting the public on either side of this portion of the trail about the construction activities. During active construction, traffic control personnel will be present to assist trail users who want to cross SR 179 at this location. Any extension of the existing concrete box culvert at MP 309.9 will be constructed at the same size or larger to accommodate the existing trail crossings.

The temporary occupancy of the Section 4(f) resource will be minimal. The H. T. Trail will be impacted for only the length of time required for the construction of the roadway improvements where the trail crosses SR 179 and not for the duration of construction for the entire project. The magnitude of impact to the Section 4(f) resource will be minor because the improvements will consist of extending the existing box culvert along the same alignment. The land will remain under the management of the Coconino National Forest once construction is completed and will be fully restored to preconstruction conditions, with no permanent interference with the purpose of the Section 4(f) resource. No permanent adverse physical impacts are anticipated, and the use of the trail will continue during construction. The Coconino National Forest is a cooperating agency on the EA and has agreed that the temporary occupancy of the Section 4(f) resource is minimal. Therefore, there is no actual "use" or "constructive use" of the H. T. Trail as defined in 23 CFR § 771.135(p)(1)(2)(3).

4. Templeton Trail

The Coconino National Forest has developed a trail system that includes the H. T. and Templeton Trails located west of SR 179 that will use the scenic pull-outs at MP 309.9 and MP 308.4. The planning effort has taken place in coordination with ADOT and its roadway improvements study team. The Templeton Trail crosses SR 179 near MP 308.4 and uses the existing box culvert to cross the highway. The box culverts near the scenic pull-outs at MP 308.4 and MP 309.9 will be constructed at the same size or larger to accommodate the pedestrian and bicycle crossings at these locations and would be considered part of the trail.

The roadway improvements will not result in any substantive proximity impacts and will not interfere with the intended use, integrity, and function of the Templeton Trail once completed. The culvert crossing under SR 179 is a benefit to trail users and will provide them with continuous access along the segment of the trail without having to cross the state highway at-grade. There will be a temporary occupancy of the land at the crossing of the Templeton Trail under SR 179 during the extension of the existing box culvert. It is anticipated that the culvert extension construction will take approximately three months. There are no prudent or feasible alternatives to avoiding the construction of the new box culvert under SR 179. Construction of a temporary pedestrian overpass will create more disturbance to the land, substantially lower the visual quality and character of the setting, and cost approximately \$200,000. Because of the linear nature of both the drainage and roadway, there are no other roadway alignments that will avoid the drainage that the Templeton Trail uses, unless the highway was routed completely away from the existing highway corridor. Environmental consequences created by a new highway or trail alignment would potentially include impacts to wildlife habitats, degradation of inherent scenic quality, and disturbance to cultural resource features.

Temporary signs and flashing lights will be placed at the crossing near MP 308.4 to warn motorists of pedestrians crossing the highway. Signs will be posted at the Templeton and North Bell Rock Pathway trailheads alerting the public on either side of this portion of the trail about the construction activities. During active construction, traffic control personnel will be present to assist trail users who want to cross SR 179 at this location. Any extensions of the existing concrete box culverts at MP 308.4 will be constructed at the same size or larger to accommodate the existing trail crossings.

The temporary occupancy of the Section 4(f) resource will be minimal. The Templeton Trail will be impacted for only the length of time required for the construction of the roadway improvements where the trail crosses SR 179 and not for the duration of construction for the entire project. The magnitude of impact to the Section 4(f) resource will be minor because the improvements will consist of extending the existing box culvert along the same alignment. The land will remain under the management of the Coconino National Forest once construction is completed and will be fully restored to preconstruction conditions, with no permanent interference with the purpose of the Section 4(f) resource. No permanent adverse physical impacts are anticipated, and the use of the trail will continue during construction. The Coconino National Forest is a cooperating agency on the EA and has agreed that the temporary occupancy of the Section 4(f) resource is minimal. Therefore, there is no actual “use” or “constructive use” of the Templeton Trail as defined in 23 CFR § 771.135(p)(1)(2)(3).

5. Summary of Section 4(f) Resources Evaluation

There are four Section 4(f) resources that either span or are located within the study area on National Forest lands. Three of the four Section 4(f) resources will have a temporary occupancy of the land. According to 23 CFR § 771.135(p)(7), “a temporary occupancy of the land is so minimal that it does not constitute a use within the meaning of Section 4(f) when the following conditions are satisfied:

- (i) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;
- (ii) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) resource are minimal;
- (iii) There are no anticipated permanent adverse physical impacts, nor will there be interference with the activities or purposes of the resource, on either a temporary or permanent basis;
- (iv) The land being used must be fully restored, i.e., the resource must be returned to a condition which is at least as good as that which existed prior to the project; and
- (v) There must be documented agreement of the appropriate Federal, State, or local officials having jurisdiction over the resource regarding the above conditions.”

Therefore, there will not be an actual “use” or “constructive use” of any of the Section 4(f) resources by the widening of SR 179. The potential effects from the improvements will be short-term, minor inconveniences to the public that will not be considered adverse in terms of the statute’s preservationist purposes.

F. Air Quality

This project is in an area where the State Implementation Plan (SIP) does not contain any transportation control measures, and all National Ambient Air Quality Standards (NAAQS) are being met. However, further assessment of microscale air quality impacts was warranted because of the increased capacity of the highway. Of the various airborne pollutants emitted by motor vehicles, carbon monoxide (CO) is of primary concern in the vicinity of the project. CO concentrations are typically localized along roadways with high-volume, slow-moving traffic and in the vicinity of congested intersections. In addition, the highest CO readings occur during the winter months due to temperature inversions and lower temperatures, resulting in higher vehicular CO emissions.

Microscale CO modeling was conducted to quantitatively analyze the impacts of the vehicular emissions of the Selected Alternative. The modeling information is available at ADOT Environmental Planning Group (EPG). Higher levels of CO are projected only for the “Y” area in the design year, but are not projected to exceed standards (Watson 2002). Based on the analysis, the improvements will have no permanent adverse affect on the air quality in the surrounding area after completion. The main causes of CO are vehicle speed changes and vehicle idling. One of the primary purposes of the project is to move current and future traffic volumes through this area at an acceptable level of service. Completion of this project will greatly increase traffic handling capabilities and reduce idling and speed changes. Vehicle emissions from any out-of-direction travel caused by the raised medians are considered negligible. Some deterioration of air quality can be expected during construction, due to the operation of construction equipment combined with the slower traffic speeds associated with a construction zone. However, this will be a localized condition that will cease when the project is completed. Dust generated from construction activities, however, will be controlled and minimized. The directives of the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction*, Section 104.08 Prevention of Air and Noise Pollution (2000 Edition) to observe and comply with all air pollution ordinances, regulations, orders, etc. from those agencies having jurisdiction will be followed.

According to *Arizona Department of Transportation’s Standard Specifications for Road and Bridge Construction*, Section 104.08 Prevention of Air and Noise Pollution (2000 Edition), the ADOT District Office will direct the contractor to suspend all work activities until further notice in the event that the Governor declares an air pollution emergency for the project area.

In summary, there will be no permanent impact on air quality once construction activities are completed. Completion of this project will greatly increase traffic handling capabilities and reduce idling and speed changes. During construction, some deterioration of air quality can be expected because of the operation of construction equipment combined with the slower traffic speeds that are associated with a construction zone.

G. Noise

The projected impacts of traffic noise from the widening of SR 179 on sensitive land uses was analyzed to identify areas that may be considered for mitigation. The study of the noise environment adjacent to the project was made in accordance with 23 CFR § 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise and the *Arizona Department of Transportation Noise Abatement Policy* (NAP) (March 2000). These are implemented by first delineating land use categories sensitive to noise.

The three activity category type land uses found along the roadway corridor are: Activity Category B, which includes motels, churches, residences, etc.; Activity Category C, which relates to businesses and other less noise sensitive areas; and Activity Category D, undeveloped land. ADOT does not provide mitigation for noise impacts to commercial properties; as a result only Category B land uses were modeled for this project. Noise impacts are also considered to occur if the sound level approaches or exceeds 3 dBA of 67 dBA for Category B type land uses per FHWA’s Noise Abatement Criteria (NAC). Traffic noise impacts also occur when the predicted traffic noise level substantially (15 dBA) exceeds the existing noise level.

Forty primary noise receivers were identified within the study area. Table G-1 in Appendix G contains information depicting receiver and potential sound barrier locations. These receivers were identified because of their land use and proximity to the alignment alternative. They include multi- and single-family residences (both existing residences and un-built residential lots), hotels/motels, and churches within the study area. Table G-1 in Appendix G lists the receiver numbers, description, the activity category, land use, number of units, the existing peak noise levels, the predicted peak noise levels in 2025 with the No Action Alternative and with the Selected Alternative, and noise mitigation considerations.

Noise levels for the current conditions (2001) and for the No Action Alternative (predicted 2025) scenarios approached or exceeded the NAC of 64 dBA at 12 of the 28 receivers representing residential sites within the project. Oak Creek Estados (Receiver 2) and a residence at Talia Court (Receiver 4) had projected noise levels of 67 dBA. Both Oak Creek Estados and the Talia Court residences' are near SR 179.

Noise levels for the current conditions and the No Action Alternative scenarios approached the NAC of 67 dBA at all of the nine hotels/motels within the study limits. Eight of the nine hotel/motel sites have direct access to SR 179. Only Wildflower Inn (Receiver 38) does not have direct access. None of the three churches modeled approached or exceeded the NAC.

The Selected Alternative (Alternative C) had year 2025 projected noise levels that approached or exceeded the NAC at 22 of the 28 residential receivers modeled. All nine of the hotels modeled and one of the three churches had projected noise levels that approached or exceeded the NAC. St. Luke's Episcopal Church (Receiver 33) was the only church modeled that has an outdoor use area fronting SR 179 and was the only church having a predicted noise level (66 dBA) that approached or exceeded the NAC.

Sound barriers were modeled at the receiver locations that approached or exceed the NAC. The results are illustrated in Table G-2 in Appendix G along with barrier stationing, height, area, and approximate cost. Preliminary locations for sound barriers are shown in Appendix C. Figure 14 on page 57 indicates the general location of the potential sound barriers. Twelve receivers fall within ADOT's guidelines of \$35,000 per affected residence for sound barriers. These 12 receivers include both single- and multi-family residences, and the sound barriers recommended will benefit 30 residential units. Sound barriers for the remaining 10 residential receivers are not recommended because they exceeded ADOT's NAP of \$35,000 per benefited residence or do not achieve a 5-dBA reduction in noise level. The inability to achieve the 5-dBA reduction reflects, in some cases, the gap in the barrier created by a local street or driveway that would reduce the effectiveness of the barrier.

One church and nine hotels have predicted future peak-hour noise levels between 66 dBA and 70 dBA. These predicted noise levels approach or exceed FHWA's NAC (see Table G-1 in Appendix G). The church and eight of the nine hotels have direct access to SR 179. The gaps created by maintaining this physical access would greatly reduce the effectiveness of potential sound barriers. In addition, hotels/motels typically want the visibility from the roadway. Therefore, noise abatement measures are not recommended for these ten receivers. The one hotel without direct access to SR 179 does not have an outdoor use area and, therefore, mitigation is not recommended.

While noise may be a concern with residents, aesthetics (the view) may also be a concern. Prior to the start of construction, ADOT will meet with property owners at those sites meeting ADOT's NAP to get their opinions of the barrier construction. A barrier will be constructed only if a majority of the residents benefited by that barrier are in favor of its construction.

The contractor shall be required to meet the noise abatement requirements of Section 104.08 of the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition) during the roadway construction. If blasting is required for construction of the improvements, the contractor shall adhere to Section 107.10 of the *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition). The final roadway surface course will consist of 1.3-centimeter (0.5-inch)-thick rubber-modified porous asphalt friction course.

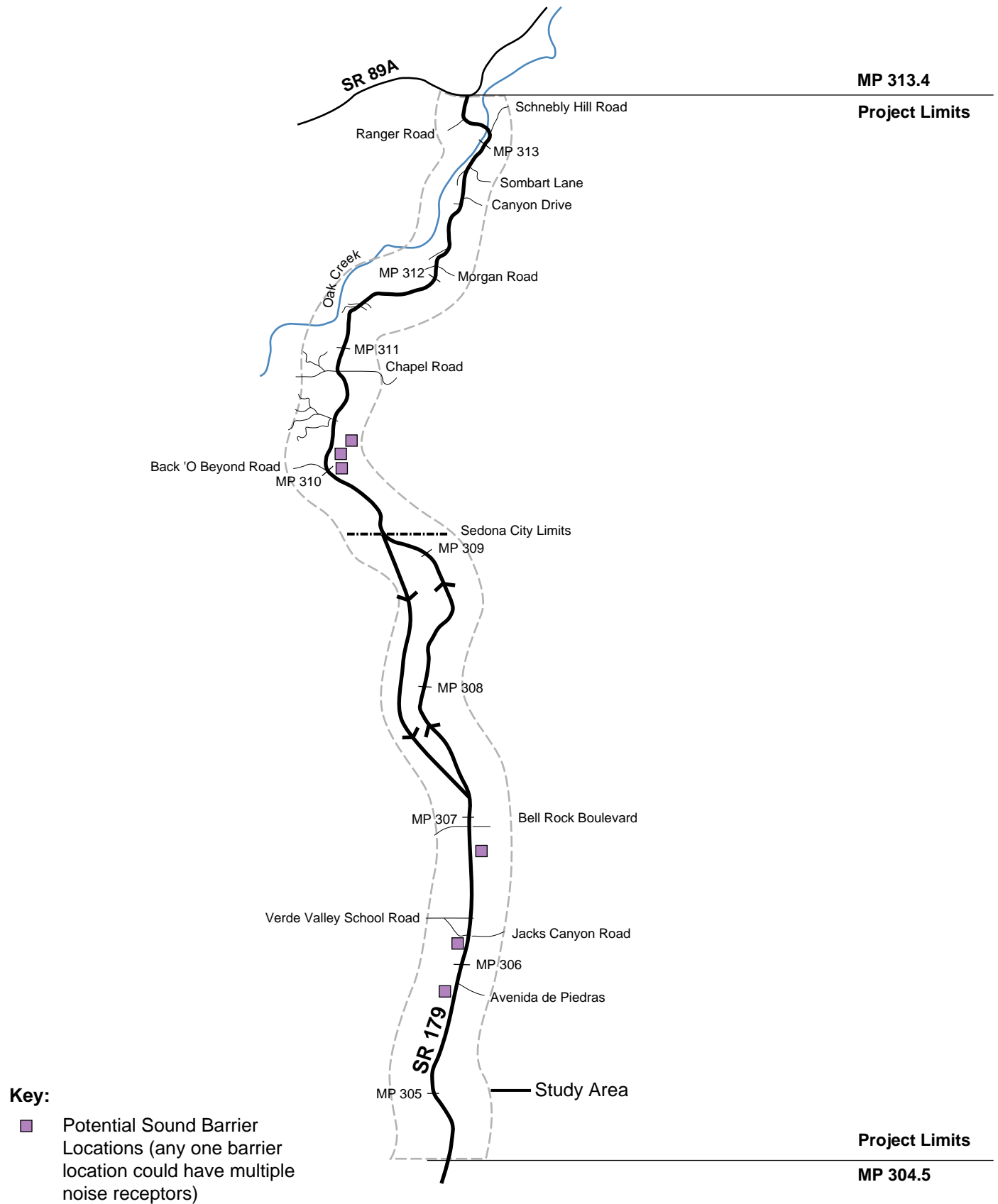


Figure 14. Potential sound barrier locations



In summary, the highway improvements will increase noise levels for sensitive noise category land uses (residences, hotels, and churches) above ADOT's NAP within the study area, based on the preliminary noise analysis. The final locations, lengths, and heights of noise abatement measures for the recommended 12 residential receivers will be determined in final design.

H. Landscape/Vegetation Removal/Invasive Species

Portions of the right-of-way have been previously cleared of vegetation for construction of the existing roadway, residential uses, and other types of development. Additional areas within the new right-of-way boundaries required to construct the improvements will be cleared and grubbed. Erosion control will be in accordance with ADOT's Standard Specifications and Section 402(p) of the Clean Water Act.

The improvements will require the removal of vegetation. Disturbed vegetation in the study area will be slow to regenerate because of the limited rain/snowfall, slope, and soil conditions. To minimize ground disturbance, construction access on National Forest lands will be pre-approved by the Coconino National Forest and shown on the project plans. The contractor shall install right-of-way fencing on National Forest lands as a first phase of construction to limit off-road access and keep cattle and wildlife from gaining access to the highway and to limit off-road vehicular access. Any equipment yards, batch plants or other construction-related activities shall occur within the designated limits of disturbance. No construction vehicle movement shall occur on National Forest lands outside the construction access limits. On non-National Forest lands, the contractor shall obtain written permission from the ADOT Engineer for construction-related activities outside the designated limits of disturbance. These measures will minimize the total area of disturbance. According to Section 107.12 of *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition), the contractor shall comply with all Coconino National Forest requirements including providing maintenance commensurate with the contractor's use of the National Forest roads and trails. In addition, the contractor shall not deface, injure, or destroy trees, shrubs, or private property except as required to complete the construction according to Section 107.11 of *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition).

Vegetation will be preserved and protected outside of the specified clearing limits. The contractor shall remove trees only when specifically authorized to do so by ADOT and will avoid damaging vegetation that is to remain in place. A resource protection plan will be included in the construction documents to identify sensitive areas such as riparian areas and natural rock outcrops within the project limits that will need to be protected from construction impacts.

Any tree or shrub planted will be irrigated for a two-year establishment period. Revegetation will occur in a progressive manner once a portion of the roadway improvements has been completed. On National Forest lands, the following plant species will be salvaged and transplanted within the project limits: pinyon pine, juniper, turbinella (scrub) oak, and manzanita. The plant quantity per plant species and plant sizes to be salvaged will be agreed to during final design by ADOT and the Coconino National Forest.

The revegetation and soil protection efforts on National Forest lands will be examined by the Coconino National Forest and ADOT one year after construction. If needed, revegetation efforts will be repeated after this first year of construction.

All removed riparian woody vegetation (such as cottonwood, sycamore, and ash trees) 10 centimeters (4 inches) or larger in caliper will be replaced with five-gallon container-grown plants or pole plantings of

commensurate native species and will be shown on the landscape plans prepared for the project during final design.

Slashings (tree trunks, branches, stumps, cacti and other vegetation) and excess rock and soil material resulting from clearing operations on National Forest land will be deposited in sites approved by the Coconino National Forest. Brush or roots will be chipped and spread at the approved sites in a natural, unobtrusive manner.

Under Executive Order 13112, dated February 3, 1999, projects which occur on federal lands or are federally funded must “subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: i) prevent the introduction of invasive species; ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; iii) monitor invasive species populations accurately and reliably; and iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded.”

In accordance with Executive Order 13112, the project area was surveyed by a qualified invasive species authority, and it was determined that there are invasive weeds within the study area. Wild oats (*Avena fatua*), Diffuse Knapweed (*Centaurea diffusa*), Kochia (*Kochia scoparia*), Dalmatian toadflax (*Linaria genestifolia*), Johnson grass (*Sorghum halepense*), and mullein (*Verbascum thapsus*) were located. These invasive species will be treated prior to construction according to ADOT’s Natural Resources Section’s invasive species management plan. ADOT will continue any necessary treatments following construction completion according to the Natural Resource Section’s invasive species management plan. To prevent the spread of invasive species to uncontaminated areas, all earth-moving and hauling equipment will be washed prior to entering or leaving the construction site. The contractor shall contact ADOT’s Natural Resources Section to inform ADOT of the wash site location(s). Vehicles not involved with construction, such as inspection or supervisory type vehicles and contractor personnel vehicles, must be staged in an area where there are no invasive species present. Furthermore, all disturbed soils will be seeded using native species to help prevent the reestablishment of invasive species. Any fill, seed, or mulch material brought in from off-site will be free of invasive species, and construction equipment will be free of invasive species and toxic materials. Therefore, there will be no substantial impact from vegetation removal or the potential to spread invasive species.

I. Vegetation and Wildlife

Vegetation types within the study area include pinyon pine/juniper woodland, interior chaparral, and deciduous riparian forests. Typical species of the pinyon pine/juniper woodland include the Colorado pinyon pine, one-seed juniper, and Utah juniper. Characteristic chaparral shrub species are tough-leaved evergreens such as scrub oak, manzanita, sugar sumac, mountain mahogany, and wait-a-minute bush. Riparian forests include such species as cottonwood, willow, ash, and sycamore which are broadleaf, deciduous trees. Arizona cypress occurs along several of the ephemeral drainages within the study area, including Jacks Canyon. Typical grass species include western wheatgrass, blue grama, squirreltail, and Indian ricegrass. Prickly pear, cholla, and hedgehog represent the commonly found cacti within the study area. Of the approximately 44.3 hectares (109.5 acres) of National Forest land, approximately 23.1 hectares (57.1 acres) would be initially disturbed by construction activities, but would be revegetated. The remainder, approximately 21.2 hectares (52.4 acres), will be permanently disturbed by the roadway and scenic pull-out parking areas.

Riparian habitats within the study area include Jacks Canyon, Margs Draw, and Oak Creek and are shown in Figure 15 on page 61. Jacks Canyon is essentially an ephemeral (dry) wash that parallels a portion of SR 179

between MP 304.5 and MP 305.5. Oak Creek is perennial from its headwaters to its confluence with the Verde River. Important riparian habitats are present along Oak Creek's entire corridor. A total of approximately 0.4 hectare (0.9 acre) of riparian habitat along a combination of perennial and ephemeral drainages will be permanently disturbed and 0.3 hectare (0.8 acre) will be temporarily disturbed within the study limits. The area of disturbance for the project (excluding the existing pavement) will be 49.2 hectares (121.6 acres).

Oak Creek has been designated as a Unique Water by the Water Quality Control Council of ADEQ because of its recreational and ecological significance. Stringent water quality standards protect Oak Creek from degradation. The reconstruction of the bridge at Oak Creek will remove a minimal amount of riparian vegetation. Adherence to ADEQ's water quality standards and mitigation measures identified in Section N will minimize disturbances to the aquatic life within Oak Creek.

Numerous birds, mammals, reptiles, fish, and amphibians are present within the study area. These include desert mule deer, javelina, pinyon mouse, pinyon jay, gray flycatcher, coyote, and plateau striped whiptail. Wildlife movement corridors have been identified by the Arizona Game and Fish Department (AGFD) in several areas across the existing highway. These corridors are crossings for wildlife such as javelina, mule deer, coyote, smaller mammals, and reptiles. Elsewhere within the study area, urbanization has already affected and altered wildlife movement. Typically, wildlife movement corridors are associated with ephemeral or perennial drainages. Coordination with AGFD has identified four wildlife movement corridors that cross SR 179. These wildlife movement corridors are shown on Figure 15 on page 61.

Populations of animals are not expected to be impacted by the roadway improvements. The wide, undisturbed median in the National Forest will provide cover and a safe zone for animals, especially deer, and will lower the potential for vehicle collisions. The deer foraging habitat will be affected by the new southbound alignment and the scenic pull-out near MP 308.4 (Station 496+400). According to the Coconino National Forest and AGFD, water collection sources will be provided on both the east and west side of the project as mitigation for this loss of habitat at the pull-outs near MP 308.3 (Station 496+200 northbound) and MP 308.4 (Station 496+400 southbound). AGFD will maintain these collection sources after construction. To accommodate wildlife movement (specifically javelina and other small mammals) in the four AGFD-identified wildlife movement corridors, newly constructed box culverts will be at least 1.2 meters (4 feet) high by 1.2 meters (4 feet) wide. Exact location of new culverts will be determined during final design. Because the creek is the area's only perennial watercourse and the most promising habitat for any riparian reptiles or amphibians (snakes or frogs) in the area, the contractor shall move any such fauna encountered during reconstruction of the bridge at Oak Creek out of harm's way.

Short-term disturbance to wildlife or wildlife habitat will occur during the time of construction and include the temporary displacement of bird species and possible mortality of small burrowing mammals. Long-term loss of habitat for some species is anticipated where the bifurcated section will be constructed. The wildlife habitat within the existing roadway corridor is already considered degraded by AGFD because of the presence of urban development and the existing highway. Vegetation will be preserved and protected outside of the specified clearing limits. The contractor shall remove trees only when specifically authorized to do so by ADOT and will avoid damaging vegetation that is to remain in place. All removed riparian woody vegetation (such as cottonwood, sycamore, and ash trees) 10 centimeters (4 inches) or larger in caliper will be replaced with 5-gallon container-grown plants or pole plantings of commensurate native species and will be shown on the landscape plans prepared for the project during final design.

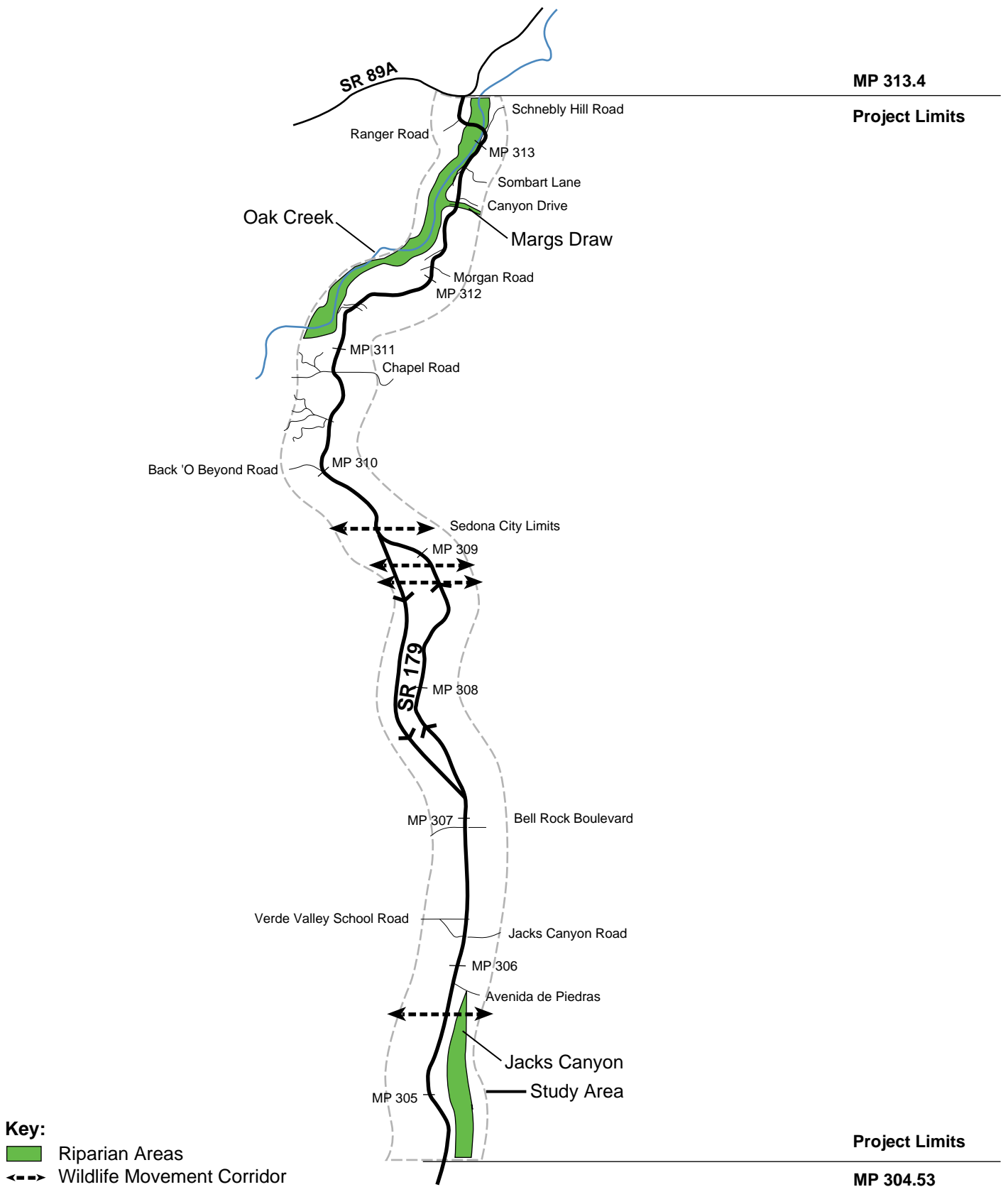


Figure 15. Riparian habitat and wildlife movement corridors



In conclusion, there will be no substantial impact to vegetation and wildlife species within the study area with the implementation of the roadway improvements because of the existing degradation of wildlife habitat adjacent to the highway corridor in the urbanized areas, accommodation of wildlife movement by newly constructed box culverts, limited vegetation removal, revegetation of disturbed areas, and construction of water collection sources on either side of the highway.

J. Wildlife Management Indicator Species

According to the Coconino National Forest's Sedona Ecosystem Management Area, the effects to the wildlife management indicator species are intended to reflect ecosystem health. The ecosystems represented in the SR 179 corridor include pinyon-juniper, Verde Valley, and riparian. Management indicator species for these ecosystems include elk, mule deer, antelope, juniper titmouse, cinnamon teal, Lincoln's sparrow, yellow-breasted chat, Lucy's warbler, and aquatic macroinvertebrates.

1. Elk

Goals for elk management on the Coconino National Forest are to manage elk populations near habitat potential, to improve habitat to its potential through cooperation between AGFD and the Coconino National Forest, and to provide maximum recreational opportunities to consumptive and non-consumptive users. Several resident populations of elk occur in the Sedona Ecosystem Management Area. The SR 179 corridor lies within Game Management Unit 6A (Munds and Lee Mountains). The majority of elk use occurs during the winter months when snow levels in the rim country are too deep for successful grazing on grass and forb species. When these food sources are depleted, the elk then browse on the shrub species, which results in competition for food between elk and deer. A small herd of elk has been observed to the south of the study area, near MP 303/302. Movement of elk across the highway corridor has been noted by AGFD to be of low density and inconsistent. The improvements to SR 179 will not adversely affect the elk populations within the 6A Game Management Unit.

2. Mule Deer

Mule deer management goals on the Coconino National Forest are the same as for elk. The desired population level for the Coconino National Forest is between 9,800 and 15,000 adult mule deer. In the Sedona Ecosystem Management Area, mule deer populations are below desired levels. Competition with elk for browse species occurs in key elk winter range (Casner, Munds, and Lee Mountains). Mule deer are found from low deserts to high-elevation forests, often concentrated on edges of vegetation. They browse on shrub-live oak, sumac, skunk bush, mountain mahogany, buckbrush, manzanita, junipers, mesquite, catclaw, some grasses, and forbs. As previously discussed, the deer foraging habitat will be affected by the new southbound alignment and the scenic pull-out near MP 308.4 (Station 496+400). Water collection sources will be provided as mitigation for this loss of habitat at the pull-outs near MP 308.3 (Station 496+200 northbound) and MP 308.4 (Station 496+400 southbound). The improvements to SR 179 will not adversely affect the mule deer populations within the 6A Game Management Unit.

3. Antelope

Antelope management goals on the Coconino National Forest are the same as for elk and mule deer. The desired population level for this National Forest is between 1,700 to 2,600 adult pronghorn. Pronghorn are a species of concern to AGFD because of statewide habitat losses and population declines. Management of the

pronghorn is largely dependent on range, pinyon-juniper, predator, and hunt management. Of primary concern in pronghorn management is the provision of hiding cover for fawns, forage, and water. A small herd of about 40 antelope range within and adjacent to the Sedona Ecosystem Management Area, but according to AGFD, they have not been observed within the SR 179 corridor. The improvements to SR 179 will not adversely affect the antelope populations within the 6A Game Management Unit.

4. Juniper Titmouse

The juniper titmouse is associated with junipers, pinyon, and oak woodlands where it nests in snags and feeds on insects. The Coconino National Forest objective for this species is to increase populations. A portion of the approximately 23.1 hectares (57.1 acres) of temporary disturbance and 21.2 hectares (52.4 acres) of permanent loss consists of juniper, pinyon, or oak woodlands. However, the amount of suitable nesting and foraging habitat that will be impacted is insignificant when compared to the total available habitat within the Coconino National Forest. Therefore, the project is not likely to result in forest-wide population declines.

5. Cinnamon Teal

The objective for management on the Coconino National Forest for this small duck is to increase populations. The cinnamon teal breeds on lakes, ponds, and tanks above the Mogollon Rim, all of which are outside the project area; therefore, the improvements to SR 179 will not impact the duck's breeding habitat. However, this species is a migrant and common winter visitor to Oak Creek. While the improvements will not substantially impact surface waters the cinnamon teal may utilize for migrating or foraging (0.1 hectare [0.3 acre] of permanent loss in Oak Creek), construction activities may cause this species to avoid the area during periods of construction. Therefore, the project is not likely to result in forest-wide population declines.

6. Lincoln's Sparrow

The Lincoln's sparrow is a summer resident that breeds in bogs, wet meadows, and riparian habitats above the Mogollon Rim. They nest in shallow depressions in grass, moss, and sedges and feed primarily on insects. The Coconino National Forest's objective for this species is to maintain population levels. The improvements to SR 179 will not affect the Lincoln's sparrow's breeding habitat.

7. Yellow-breasted Chat

The yellow-breasted chat is a summer resident of dense mesquite and riparian deciduous forests adjacent to streams. This bird builds a cup nest in dense stream-side shrubs, and nests have been found along Oak Creek. The Coconino National Forest's objective for the yellow-breasted chat is to increase population levels. The roadway improvements will result in the loss of approximately 0.7 hectare (1.7 acres) of suitable nesting and/or foraging habitat (i.e., riparian habitat). In addition, construction activities (or noise associated with construction activities) may cause yellow-breasted chats to avoid the area temporarily, and may cause individuals nesting near construction activities to abandon their nests. However, the amount of suitable habitat that would be lost is negligible compared to the total available habitat within the Coconino National Forest. As mitigation, all riparian trees 10 centimeters (4 inches) or larger in caliper will be replaced with commensurate native species. Furthermore, Yellow-breasted Chats are territorial, with an estimated territory size of

0.4 hectare (1 acre) to 2.0 hectares (4.9 acres), thus it is unlikely that a substantial number of yellow-breasted chats would experience reproductive loss due to nest abandonment. Therefore, the project is not likely to result in forest-wide population declines.

8. Lucy's Warbler

Lucy's warbler is a summer resident of dense mesquite and cottonwood riparian forest at lower elevations. This species nests in cavities in trees and snags, and has been found along Oak Creek. The Coconino National Forest objective for Lucy's warbler is to increase population levels. The roadway improvements will result in minimal loss of riparian vegetation, and all riparian trees 10 centimeters (4 inches) or larger in caliper will be replaced with commensurate native species. However, increased noise associated with construction activities may cause Lucy's warblers to temporarily avoid the area during periods of construction, and could potentially cause individuals nesting in close proximity to construction to abandon their nests. Like the yellow-breasted chat, Lucy's warblers are territorial; it is unlikely that a substantial number of Lucy's warblers would experience reproductive loss due to nest abandonment. Therefore, the project is not likely to result in forest-wide population declines.

9. Aquatic Macroinvertebrates

Because many species of aquatic invertebrates are vulnerable to pollution and die off, if conditions exceed their tolerance limits, measures of diversity and productivity in aquatic invertebrate populations can be used as an indicator of stream health. Water quality in Oak Creek must comply with Arizona State water quality standards and the State Unique Water status of Oak Creek. Measures taken to minimize impacts to Oak Creek are described in Section N. With these mitigation measures, the roadway improvements will not adversely impact individuals, populations, or habitat associated with aquatic macroinvertebrates.

10. Summary of Impacts to Wildlife Management Indicator Species

Management indicator species for the ecosystems within the study area include elk, mule deer, antelope, juniper titmouse, cinnamon teal, Lincoln's sparrow, yellow-breasted chat, Lucy's warbler, and aquatic macroinvertebrates.

The improvements to SR 179 will not adversely affect these populations because either the species presence in the corridor is considered to be of low density and inconsistent, their breeding or foraging habitat will not be affected, there will be a minimal loss of vegetation and riparian habitat, or appropriate mitigation measures such as water collection sources will be provided.

K. Threatened, Endangered and Sensitive Species

A list of special status species (federally Threatened or Endangered, Wildlife of Special Concern in Arizona, or the Coconino National Forest sensitive species list) that may occur within the roadway corridor was requested from the U.S. Fish and Wildlife Service (USFWS), Coconino National Forest, and AGFD. There are eight federally listed endangered species with potentially suitable habitat occurring within the project area. Federally listed threatened species include bald eagle, Little Colorado spinedace, loach minnow, and spikedace, and the federally listed endangered species include Colorado pikeminnow, razorback sucker, Arizona agave, and Southwestern willow flycatcher. There is no designated critical habitat within the study area.

1. Bald Eagle

Bald eagles occur throughout the state during winter, and year around in areas along the Verde and Salt Rivers. Wintering bald eagles in Arizona are most often found in the White Mountains and along the Mogollon Rim, but also occur throughout the Verde Valley. Common nesting habitat includes large trees, snags, or cliffs near water with abundant fish and waterfowl for prey between 335.2 and 1,706.8 meters (1,100 and 5,600 feet) above mean sea level (msl). Winters are spent along major rivers, reservoirs, highways and interstates, or in other areas where fish and/or carrion is available.

The project area does contain riparian habitat associated with Oak Creek, Margs Draw, and Jacks Canyon. However, the portions of Oak Creek and Margs Draw within the project limits are located on private lands within a commercial and residential area of the City of Sedona. These areas are not considered suitable nesting habitat because of existing human disturbance. In addition, the nearest known Bald Eagle nest is located on Oak Creek near the confluence with the Verde River, approximately 25.7 kilometers (16 miles) west of the project area. The home range of a nesting pair typically does not exceed 41.4 square kilometers (16 square miles) around the nest site. The project area is located outside the home range of Bald Eagles nesting on the upper Verde River.

Although bald eagles are not known to nest within or near the project area, suitable foraging habitat for eagles does occur within the project area, especially in the riparian areas associated with Oak Creek, Margs Draw, and Jacks Canyon. However, the minimal loss of riparian vegetation (less than 0.4 hectares [1 acre]) would not affect the ability of wintering birds to forage in the area. Furthermore, all removed riparian woody vegetation 10 centimeters (four inches) or larger in caliper will be replaced with commensurate native species. Therefore, the project will not affect the bald eagle or its habitat.

2. Southwestern Willow Flycatcher

An obligate riparian nester, the Southwestern willow flycatcher is found in dense riparian vegetation adjacent to streams, ponds, lakes, and springs. Vegetative species commonly present include boxelder, willows, ash, walnut, cottonwood, seep willow, button bush, cattails, Russian olive, and tamarisk. This species prefers dense vegetation from the ground up to 6.1 meters (20 feet) high, with standing water below or next to the vegetation. In higher elevation streams, vegetation may be limited to as few as two or three species of willow in dense thickets between 4.6 meters (15 feet) and 6.1 meters (20 feet) tall.

No records exist for Southwestern willow flycatcher within the project area, and riparian vegetation within the project area does not constitute suitable habitat due to the prominence of mature cottonwood, willow, ash, and sycamore trees without dense lower-level foliage. Therefore, the project will not affect the Southwestern willow flycatcher or its habitat.

3. Colorado Pikeminnow

There are no natural populations of Colorado pikeminnow remaining within the state of Arizona, although reintroduced populations in the Verde and Salt Rivers have been established. Colorado pikeminnow are adapted to rivers with seasonally variable flow, high silt loads, and turbulence, and can withstand a wide temperature range. They primarily are found in eddies, slackwaters, slow runs, and backwaters of these rivers, generally below 1,219.2 meters (4,000 feet) above msl. This species feeds on insect larvae and zooplankton. The Colorado pikeminnow has not been known to occur in the vicinity of the project area, although there is suitable habitat. The nearest occurrences historically and currently are in the Verde River, in which fish were

reintroduced approximately 16 kilometers (10 miles) south and downstream of the Oak Creek and Verde River confluence. Because of the measures designed to reduce environmental impacts, as well as the restrictions placed on construction activities to protect aquatic habitat, no loss or degradation of habitat for the Colorado pikeminnow will occur as a result of construction activities associated with the roadway improvements. Therefore, the project will not affect the Colorado pikeminnow or its habitat.

4. Little Colorado Spinedace

The Little Colorado spinedace is restricted to north-flowing tributaries of the Little Colorado River in Apache, Navajo, and Coconino Counties. This species occupies springs, streams, and rivers with perennial flow and is generally found in pools and riffles with water flowing over gravel and silt, at elevations of between 1,219 and 2,438 meters (4,000 and 8,000 feet) above msl. The Little Colorado spinedace has a tolerance for wide water temperature fluctuations and habitat types and feeds on many different invertebrates and larvae. The tributaries that this fish occupies are found far north of the project area and are not connected to Oak Creek or the Verde River. Therefore, the project will not affect the Little Colorado spinedace or its habitat.

5. Loach Minnow

Loach minnows are known to inhabit limited reaches along the White River in Gila and Navajo Counties, and Aravaipa and Campbell Blue Creeks, as well as along the San Francisco and Blue Rivers. This species is found in small to large perennial streams with swift, shallow water flowing over cobble and gravel. They prefer the turbulent, rocky riffles of mainstream rivers and tributaries in plant communities consisting of open, low-growing, riparian vegetation composed mostly of grass and shrubs.

Although the loach minnow does not occur in the project vicinity, there is unoccupied designated critical habitat located downstream of the study area, approximately 243 meters (800 feet) from the existing alignment of SR 179 near MP 311.2. The designated critical habitat in this reach of Oak Creek, is however, considered to be degraded habitat. Construction activities that could indirectly affect the designated critical habitat include: widening of the Oak Creek Bridge (located approximately 3.2 kilometers [2 miles] upstream of the critical habitat); construction of a 74.7-meter (245-foot) retaining wall (located approximately 3.2 kilometers [2 miles] upstream from the critical habitat); and development of a potential future scenic pull-out (located approximately 243 meters [800 feet] upstream of the critical habitat). According to USFWS, the area upstream of the designated critical habitat is considered unsuitable for the loach minnow due to existing urban and suburban development and the stream channel characteristics.

To further reduce the potential for indirect impacts to designated critical habitat for the loach minnow, ADOT District will monitor all mitigation measures addressing sedimentation and erosion control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas. Because of the measures designed to restrict construction activities to protect the aquatic habitat and water quality of Oak Creek, no loss or further degradation of habitat for the loach minnow will occur as a result of roadway improvements. The potential indirect effects from the temporary construction activities will not diminish the value of the designated critical habitat downstream of the study area. Any increase in turbidity is anticipated to be insignificant when compared to the typical sediment loads in Oak Creek occurring during average storm runoff. Therefore, the project will not affect the loach minnow or its habitat.

6. Razorback Sucker

Razorback suckers exist only in small populations in Lake Mohave, Lake Mead, and Lake Havasu, as well as in the lower Yampa and Green Rivers, the mainstem of the Colorado River, and the lower San Juan River. Razorback suckers can live more than 40 years and can occupy a number of different habitats. They are generally found in the backwaters or slow-moving areas of riverine and lacustrine environments, sometimes inhabiting reservoirs, and occur at elevations less than 1,829 meters (6,000 feet) above msl. This species shows an extreme seasonal change in habitat preference, having an affinity for slower, deeper waters in the winter months, while in the summer months, inhabiting more rapid and shallow waters. In addition, spawning usually occurs during the spring, depending on temperatures, and evidence suggests that these fish may even migrate to smaller tributaries to spawn.

The razorback sucker does not occur within the project vicinity, but there is critical habitat designated along the Verde River at the confluence with Oak Creek, which is approximately 32 kilometers (20 miles) downstream of the study area. Because of the measures designed to protect the aquatic habitat and water quality of Oak Creek, no loss or degradation of habitat for the razorback sucker will occur as a result of construction activities associated with the roadway improvements. Therefore, the project will not affect the razorback sucker or its habitat.

7. Spikedace

The spikedace occurs in Aravaipa Creek, Eagle Creek, and the upper Verde River in Yavapai County, Arizona. The habitat of this species consists of moderate to large, shallow, perennial, moderate-gradient streams with sand, gravel, and/or cobble substrates, usually in association with riparian vegetation. The elevation is generally less than 1,828.8 meters (6,000 feet). While spikedace are currently absent from Oak Creek, unoccupied suitable habitat occurs in Oak Creek downstream of the project area. Although dependent on the time of year and the habitat location, this carnivorous fish generally feeds on insects and their larvae. The decline of the spikedace is mostly due to competition with nonnative species and habitat depletion such as water impoundment, stream channelization, dams, diversions, bank stabilization, and other erosion control efforts, as well as grazing, mining, timber harvesting, and other developments.

Because of the mitigation measures designed to reduce impacts to Oak Creek, no loss or further degradation of habitat for the spikedace will occur as a result of construction activities associated with the roadway improvements. The potential indirect effects from the temporary construction activities will not diminish the value of the designated critical habitat downstream of the study area. Any increase in turbidity is anticipated to be insignificant when compared to the typical sediment loads in Oak Creek occurring during average storm runoff. Therefore, the project will not affect the spikedace or its habitat.

8. Arizona Agave

Arizona agave populations are located in the transition zone where the Colorado Plateau, the Mogollon Rim, the Colorado Desert, and Arizona Upland Desert converge. This species is typically found on ridges and drainages in chaparral and juniper-grassland habitats, as well as in open ranges that support cattle, at elevations between 914 and 1,829 meters (3,000 and 6,000 feet). Soil associations are identified by shallow, cobbly, gravelly, sloping hills with rock outcrops.

There are no records of Arizona agave in the project vicinity and the project area is outside of the known distribution. However, potentially suitable habitat does occur within the project area. ADOT EPG will conduct

surveys for the Arizona Agave 30 days prior to any ground-disturbing activities. If any Arizona agaves are found, consultation with USFWS will be initiated and the Coconino National Forest will also be notified if any plants are found on National Forest lands. All Arizona agave within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest. Therefore, the roadway improvements will not affect the Arizona agave or its habitat.

9. Coconino National Forest Sensitive Species

According to an August 2001 update from the Coconino National Forest, there are 19 sensitive species (one mammal, three birds, one fish, two amphibians, three reptiles, one plant, and eight invertebrates) that may occur within the study area. Detailed evaluation of each of the Coconino National Forest sensitive species is provided in Appendix F. The improvements to SR 179 will have no substantial impact on these sensitive species. ADOT EPG will conduct surveys for the Tonto Basin agave 30 days prior to any ground-disturbing activities. The Coconino National Forest will be notified if any Tonto Basin agave are found. All Tonto Basin agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest. If blasting is required during construction, no blasting will occur between March 1 and August 31 within the 1.6-kilometer (1-mile) radius of the Gibraltar Rock or Cathedral Rock locations to minimize potential impacts to the peregrine falcon. The no-blast area will be identified on the resource protection plans developed during final design and approved by the Coconino National Forest.

10. Arizona Native Plant Law

In accordance with the Arizona Native Plant Law, a Notice of Intent to clear protected native plants must be submitted to the Arizona Department of Agriculture at least 60 days prior to any activity, and efforts to salvage, if appropriate, must be delineated. ADOT's Roadside Development Section will submit the Notice of Intent to clear prior to the construction activities. Any salvage efforts on National Forest land will be coordinated with the Coconino National Forest prior to the Notice of Intent.

L. Visual Resources

The U.S. Department of Agriculture Forest Service established a Visual Management System (VMS) that identifies the visual characteristics of the land and defines objectives to manage visual resources. The VMS process has been updated as the Scenery Management System (SMS) (December 1996), which has been incorporated into respective Forest Management Plans. Because the specific components of the SMS have not yet been inventoried and mapped for the corridor, the VMS is being applied in the study area.

Visual Quality Objectives (VQOs) are assigned to the landscape to describe the degree of acceptable alteration permitted in the natural landscape. The VQO classifications are Preservation, Retention, Partial Retention, Modification, and Maximum Modification. Preservation allows for ecological changes only, while Maximum Modification allows for landscape changes that may dominate the natural landscape character.

The *Coconino National Forest Land and Resource Management Plan* (1987) has adopted a VQO of Retention for SR 179 (Figure 16 on page 69). However, the goal of Retention has not currently been achieved on approximately two-thirds of SR 179 (4.5 kilometers [2.8 miles]) on Coconino National Forest land in the study area. In such cases where the existing condition does not meet the goal of Retention, the long-term objective of the Coconino National Forest is to move such landscapes up to Retention by either natural healing or by

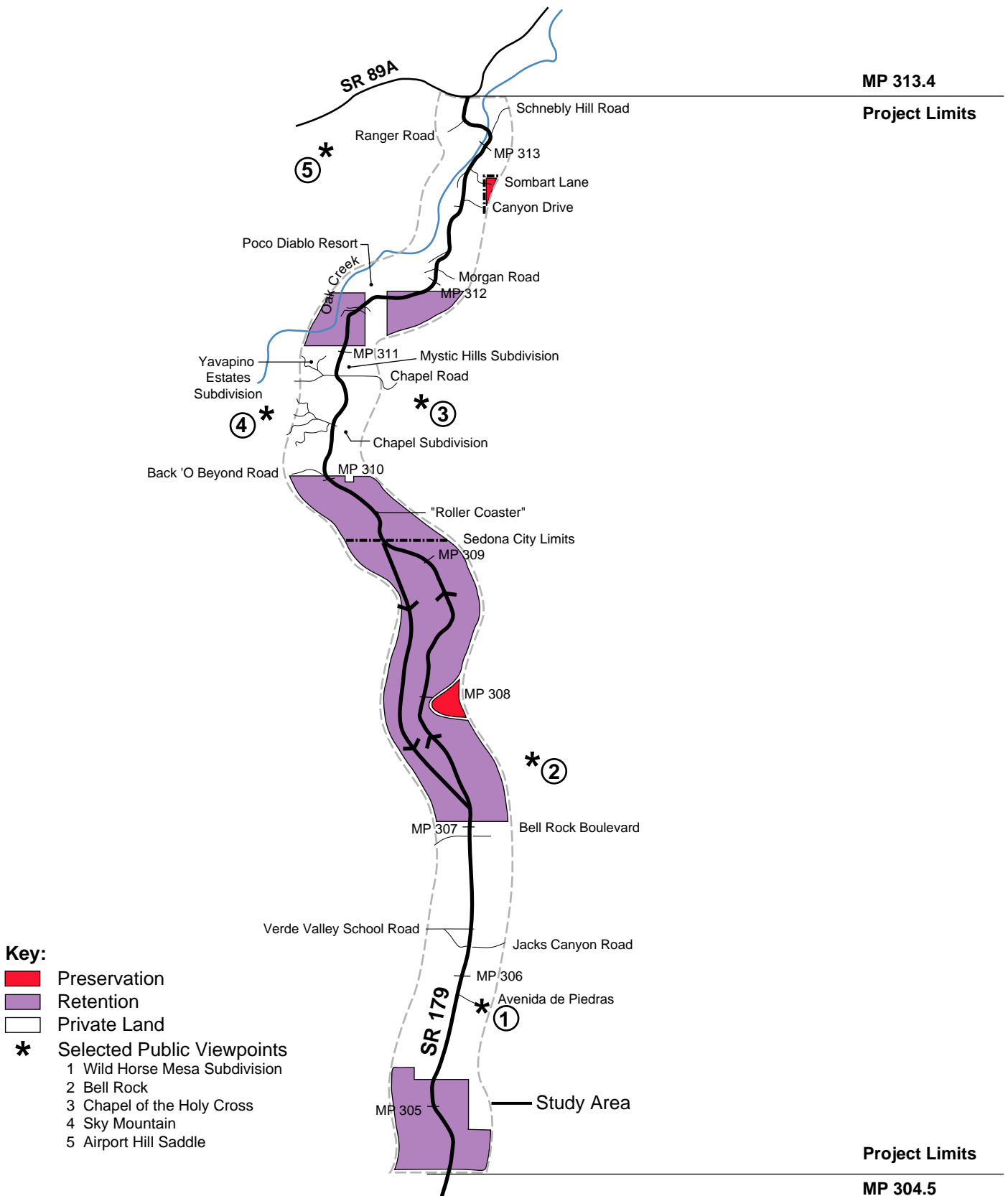


Figure 16. Visual Quality Objectives and selected public viewpoints



taking actions to rehabilitate those lands to improve the visual conditions. Therefore, any section of the roadway corridor that now is at the Modification VQO level and predicted to drop to Maximum Modification will be contrary to the Coconino National Forest's goals. For the EA purposes, the evaluation of the impact of the improvements is based upon the degree of change from the present condition. The application of the VQO only applies to National Forest lands.

1. Existing Conditions

Much of SR 179 within the project limits is designated as the Red Rock Scenic Road (MP 302.5 to MP 310.0) by the State of Arizona's Parkways, Historic and Scenic Roads Advisory Committee. The project is in a uniquely scenic area of the state and attracts local, national, and international visitors. The route traverses through the Red Rock country and provides spectacular panoramic views of eroded monuments, promontories, cliffs, and buttes. The rolling terrain in the pinyon-juniper forest provides a variety of visual experiences from a roadway enframed by evergreen vegetation contrasted with the expansive and continuously changing sequences of panoramas of the rock formations. For most of the route, only short segments of the roadway are visible, which enhances the intimate quality of this portion of SR 179. Numerous prominent features are visible from the roadway including Bell Rock, Courthouse Butte, Chapel of the Holy Cross, and Cathedral Rock. Contrasting with the red rocks and the gray-green pinyon-juniper forest is the riparian vegetation associated with Jacks Canyon and Oak Creek also visible from the highway. The mature cottonwood and ash trees enhance the visual variety of the landscape in terms of color, texture, and form.

2. Impacts on Visual Resources

As part of the evaluation of the impacts on visual resources, ten computer-generated simulations illustrating the improvements to SR 179 were developed. The simulations suggest what the study area may look like one year after construction has been completed, based on the preliminary roadway design. The effect of the improvements may vary from these simulations as a result of the specific, final roadway design. Figure 17 on page 71 shows the location of the viewpoints and Figures 18 to 28 on pages 72 to 82 are the simulations from each of these viewpoints. The existing condition photographs were taken in October of 1997. The following information describes the potential impacts from selected public viewpoints and as viewed from SR 179. Refer to Appendix D for the station locations cited in the following text.

Views from Village of Oak Creek. The scenic or visual quality from the Village of Oak Creek will be unaffected except for the views from approximately six residences in Wild Horse Mesa subdivision. Views of the cut and fill slopes created by the highway improvements will drop from the higher-level Modification to a lower level Modification from these residences. Within the commercial area of the Village of Oak Creek, the change in the visual quality will be low and the change to the existing character will be subtle because of the already developed land use adjacent to the highway.

Views from within the City of Sedona. Approximately 400 meters (1,300 feet) of the roadway north of MP 309 (Station 497+300 to Station 497+700) will be reduced from Partial Retention to Modification on the first 100 meters (325 feet) from mid-hill to the south side of the Roller Coaster. The curve at the top of the Roller Coaster will be seen by approximately ten existing residences on Sky Mountain and one residence in the Chapel area. The bottom section of the curve is visible from only approximately five residences on Sky Mountain and from the Chapel of the Holy Cross. This upper end and curve are considered to be a moderate scenic impact and the lower, straight section a minor scenic impact.

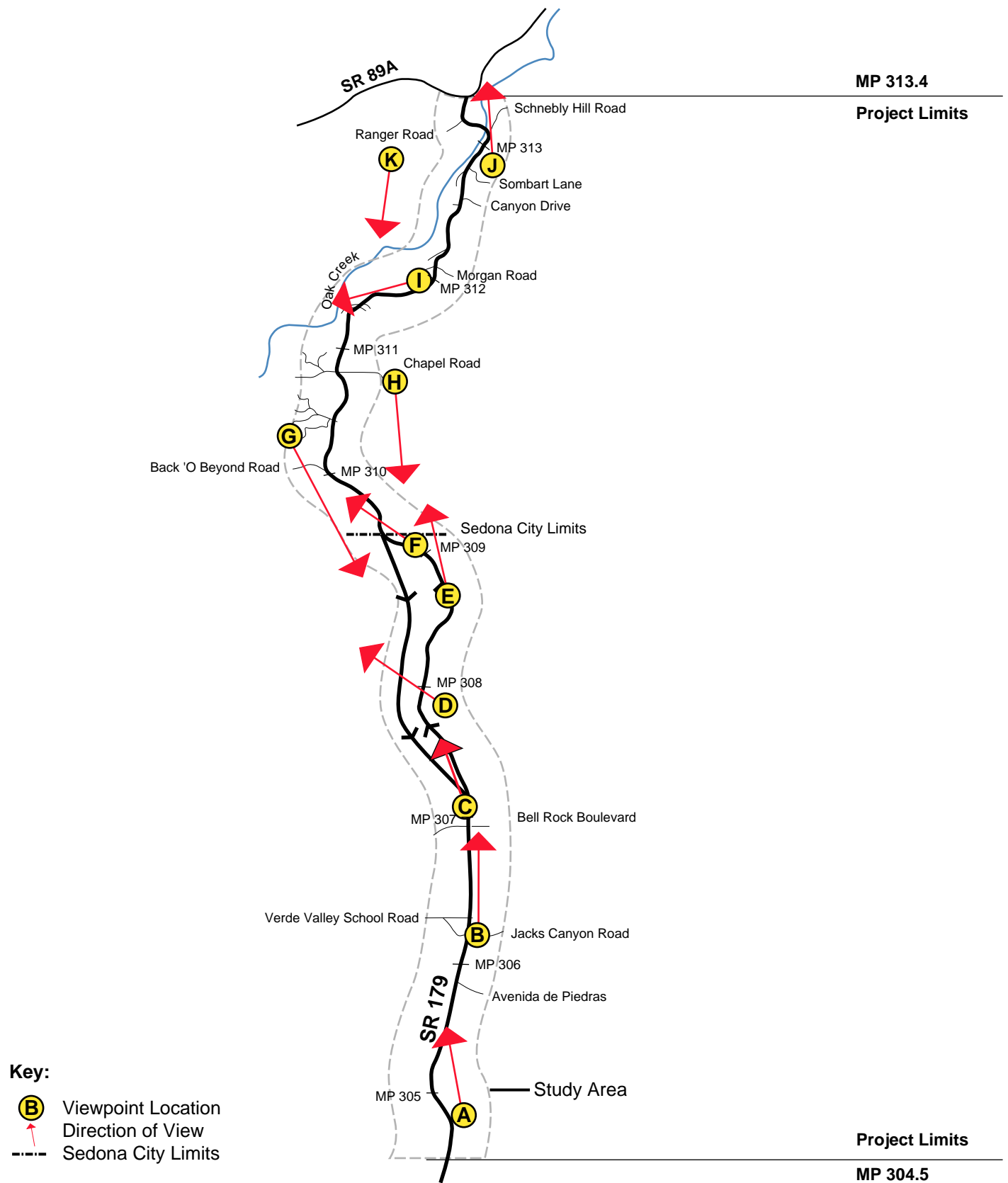


Figure 17. Visual simulation viewpoint locations





Existing



Proposed

Figure 18. Viewpoint A – Woods Canyon Trailhead (looking north, south of MP 305)



Existing



Proposed

Figure 19. Viewpoint B – Jacks Canyon Road (looking north, north of MP 306)



Existing



Proposed

Figure 20. Viewpoint C – Bell Rock Area (looking north, north of MP 307)



Existing



Proposed

Figure 21. Viewpoint D – Base of Bell Rock (looking northwest, south of MP 308)



Existing



Proposed

Figure 22. Viewpoint E – North of Bell Rock (looking north, south of MP 309)



Existing



Proposed

Figure 23. Viewpoint F – Cathedral Rock View (looking northwest, north of MP 309)



Existing



Proposed

Figure 24. Viewpoint G – Sky Mountain Road Vista (looking southeast, north of MP 310)



Existing



Proposed

Figure 25. Viewpoint H – Chapel of the Holy Cross Vista (looking south, south of MP 311)



Existing



Proposed

Figure 26. Viewpoint I – Pine Drive Intersection (looking southwest, south of MP 312)



Existing



Proposed

Figure 27. Viewpoint J – Hillside Shops Area (looking north, north of MP 313)



Existing



Proposed

Figure 28. Viewpoint K – Saddle Rock Vista (looking south, south of MP 313)

South of MP 310, approximately 700 meters (2,300 feet) of the roadway (from Station 498+300 to Station 499+000) will be reduced from the current Modification to the Maximum Modification level. This portion of the highway is from the north top of the Roller Coaster to Back 'O Beyond Road. This scenic impact will affect the views from 20 residences on Sky Mountain, those located near the top of the mountain being in view of the total impact and those lower on the landform to only parts of the impact. The change in the visual quality is considered to be a moderate scenic impact.

From Mystic Hills to near Poco Diablo Resort, approximately 450 meters (1,475 feet) will remain as Modification, although there will be change from the existing condition. The southern 200 meters (650 feet) will affect the views of approximately 15 residences in Yavapino subdivision, six residences in Mystic Hills, and eight residences on the top and north face of Sky Mountain. Retaining walls on the fill slopes along much of this section of the highway will help to retain existing vegetation, which will help screen the residences west of SR 179. The north 250 meters (800 feet) will affect the views from approximately 35 residences in various subdivisions to the north, 12 residences on Sky Mountain, 12 residences in the Yavapino subdivision, and four residences in the Mystic Hills subdivision, several casitas at Poco Diablo Resort, and the Airport Hill Saddle viewpoint. These impacts are considered to be a minor to moderate impact from views from the hillside, which is already impacted by the existing road cut and fill slopes.

Along the new alignment of the southbound roadway of SR 179 approximately 1,000 meters (3,275 feet) from MP 308.9 to MP 309.1 (Station 496+600 to Station 497+600), south of the bottom of the Roller Coaster, there will be a drop from Retention to as low as Modification. The road corridor now has no noticeable alterations to the natural landscape when viewed from the Sky Mountain and Chapel area. The new roadway will include an 80-meter (250-foot) bridge, substantial cut and fill slopes, and retaining walls. The southern 500 meters (1,625 feet) will affect the views from approximately 20 existing residences on the top and south face of Sky Mountain. The northern portion of the bifurcated roadway section will affect three to five of these same residences and the VQO will drop to Modification. Views from the Chapel of the Holy Cross will be affected by the middle 500 meters (1,625 feet) of this 1,000-meter (3,275-foot) segment of the southbound roadway alignment. The views from the Chapel will drop from Retention to Partial Retention or Modification, but much of the view of the roadway will be filtered by the existing vegetation. In addition, approximately 150 meters (500 feet) of the roadway will also affect the views from between six and eight residences in the Chapel subdivision, but these views will be filtered by the existing vegetation as well.

Views from Bell Rock Pathway. Most of the Bell Rock Pathway is screened from the highway by either vegetation or landforms and overall, there will be no substantial impact created by the construction of the highway on the views from those areas. SR 179, however, will continue to be visible for short durations at several locations along the Bell Road Pathway similar to the existing conditions. The visual resource of the landscape will be affected in these areas. Near the west side of Bell Rock (MP 307.90 to MP 308.1 [Station 495+500 to Station 495+800]), the scenic quality of the view will drop to Modification because of the three- to five-meter (10- to 18-foot) cut and fill slopes are in close proximity to the Pathway. A reduction in the scenic quality and VQOs from Retention to Partial Retention will also occur near MP 308.2 (Station 496+100) to MP 308.4 (Station 496+240) on the east side of Bell Rock. Near MP 309.6 (Station 498+100), the Bell Rock Pathway's proximity to the road and large cut bank will diminish the scenic quality of the view from Partial Retention to Maximum Modification. The scenic quality of the view will be reduced from Partial Retention to Modification near MP 309.9 (Station 498+700) because of the extent of the landscape modifications created by the cut and fill slopes.

Views from the Roadway. In general, the degree of impact on the scenic quality of the landscape from the highway traveler's point of view will be affected by the wider roadway section, magnitude of the heights of the cut and fill slopes, presence of the landscaped median, reduction in the distractions of oncoming traffic in the

bifurcated section, the opportunity for wider panoramic views of the red rock formations, and the surface treatment, height, and length of the retaining walls and sound barriers. Although some broader vistas will be created by the clearing of the vegetation through the National Forest land, much of the existing character of the travel experience from Bell Rock Boulevard to Back 'O Beyond Road will be substantially changed with the construction of the improvements. The majority of the VQOs will be maintained as viewed from the roadway with the construction of the improvements.

When the two separate roadways in the bifurcated section are visible from each other, the scenic quality of the views from the roadway will decrease simply because of the visibility of another roadway. From MP 308.9 to MP 309.1 (Station 496+600 to Station 497+600), the visual quality of the view will be diminished and the VQO will be reduced from Retention to Modification. The 9- to 15-meter (30- to 40-foot) cut slopes at the north end of the Roller Coaster will create a moderate to high scenic impact from the top of the south end of the Roller Coaster. The VQO will drop from Modification to Maximum Modification in this area. From the Chapel area to the vicinity of Poco Diablo Resort, there will be a moderate decrease in the scenic quality of the views because of the wider roadway, increased cut and fill slopes, and potential for retaining walls and sound barriers. A large retaining wall across from Poco Diablo Resort will be distracting, depending on the final height of the wall and the aesthetic treatment of the wall surface. From the Poco Diablo Resort to Ranger Road, the effect on the scenic quality of the views will be minimal because of the urban development that already exists. The overhead tubular sign near the "Y" at SR 89A will contrast with the scale of the surrounding built structures and will dominate the intersection area.

3. Summary of Visual Resource Impacts

After implementation of the mitigation measures, 29 percent of this portion of SR 179 within the Coconino National Forest, largely the stretches in the bifurcated sections of the roadway, will not meet the existing achieved VQO with the construction of the roadway improvements. For the southbound portion of the bifurcated highway, 71 percent of the southbound roadway will drop from the existing level of Retention to Partial Retention or Modification. With the implementation of the mitigation measures, the Red Rock Scenic Road designation will be maintained. The scenic impact from the Sky Mountain residences will be the greatest of the public viewpoints evaluated. A tabular summary of the effect on the scenic resources on the National Forest lands as expressed by VQO levels is provided in Appendix H.

The effect on the visual resources of the study area created by the improvement cannot be solely assessed based upon the changes in the VQO. Visual character is a descriptive assessment of the change in the patterns formed by various elements (such as color, dominance, scale, and diversity) within a given landscape. There will be a substantial change in the visual character of the roadway between Bell Rock Boulevard in the Village of Oak Creek to Back 'O Beyond Road from the existing condition because of the scale and dominance of the roadway improvements. In this portion of the study area, there will be a change in the existing northbound travel experience from a relatively narrow, winding roadway to a wider, more open, two-lane roadway through the pinyon-juniper forest. In the developed portions of the corridor within the city of Sedona and the Village of Oak Creek, the change in visual character will be less notable. The change in visual or scenic quality will vary, depending on the magnitude of the landscape modifications (cut and fill slopes) and change in views associated with the roadway improvements. The magnitude of the change in the visual quality of the landscape will range from low to moderate for the majority of the corridor. Areas where there will be high magnitudes of change in the visual quality will occur for relatively short durations, such as along the Red Rock Pathway, or where there will be high retaining walls or sound barriers for a long distance. The locations, heights, and length of the retaining walls will be determined during final design based on the refinement of the

roadway alignment and results of the geotechnical investigations. The impacts to visual quality will be reduced with the implementation of the mitigation measures described below:

- *ADOT/USFS Guidelines for Highways on National Forest Land* (1994) will be followed on National Forest lands.
- ADOT will use the FHWA's *Visual Prioritization Process* (1994) to determine priorities for mitigating visual impacts on National Forest lands. Minimally, disturbed areas that are determined to be a high priority area will be replanted with 24-inch to 80-inch box pinyon pine and juniper trees salvaged from the construction area or from local nursery stock, except in rock formations where planting this size of tree may not be feasible.
- Retaining walls, sound barriers, bridge piers, and abutments will be treated with a patterned or textured surface or faced with native stone accents in critical visual locations as appropriate to the site-specific location. Retaining walls, sound walls, concrete headwalls, bridge piers and abutments, bridge girders, the underside of the bridge deck, the exposed outward-facing exterior surfaces of the bridge barriers, and metal handrails on the bridges will be colored with an approved coloring agent that will blend with the natural surroundings. The colors and patterns or textures to be used on concrete surfaces will be coordinated with the Coconino National Forest, ADOT, the City of Sedona, the Village of Oak Creek and other appropriate organizations during final design.
- A depth of 0.3 meter to 0.6 meter (1–2 feet) of porous fill will be provided around trees adjacent to the toes of slopes. Tree wells and/or other techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by ADOT, the Coconino National Forest, and the City of Sedona.
- Signing and other roadside elements such as reflectors, delineators, and object markers will be limited to those absolutely essential.
- Any riprap used in the project will blend with the surrounding rock and exposed soil color.
- To blend with natural rock features, newly exposed rock faces will incorporate characteristics of the adjacent natural rock to include scale, shape, slope, and fracturing to the extent that is practical and feasible as identified through geotechnical testing and constructability reviews. Exposed rock cuts will be evaluated for chemical staining to blend with adjacent natural rock.
- Fill slopes will be 1:2 (vertical to horizontal) with guardrails (weathering steel) in densely vegetated and sensitive areas to provide the least visual impact and to retain as much natural vegetation as possible. Sparsely vegetated and non-sensitive areas will have 1:4 or flatter fill slopes. All fill slopes will be revegetated with native plant species as part of the project using densities similar to adjacent undisturbed areas. The Coconino National Forest will identify the limits of the densely vegetated and sensitive areas.
- Cut and fill slopes will simulate the terrain of the surrounding area. Cut and fill slopes will be constructed with varied slope ratios to leave an irregular, undulating, or roughened appearance rather than a uniform grade. The slope ratios will vary from the top to the bottom of the slope face and from station to station.
- Boulders excavated during construction will be considered for use as riprap and facing accents on

structures if the rock is competent and as approved by the Coconino National Forest for use as barrier rock in off-road locations. Boulders not used for construction needs will be placed beyond the errant vehicle recovery zone in areas where natural rock outcrops exist. These boulders will be placed in random patterns and be partially buried to simulate natural boulders in the landscape.

- Natural tone metals such as weathering steel with non-contrasting finish will be used for guardrails.
- Either planting pockets will be created in cut slopes or stepped retaining walls with plantings will be used at the following approximate locations:
 - C southbound Station 495+640 Right to Station 495+900 Right
 - C northbound Station 495+600 Left to Station 495+900 Left
 - C northbound Station 496+680 Left to Station 496+860 Left
 - C Station 500+920 Left to Station 501+100 Left
 - C Station 502+350 Left to Station 502+560 Left
 - C Station 502+600 Left to Station 503+040 Left
 - C Station 502+000 Right to Station 502+940 Right
 - C Station 503+340 Left to Station 503+480 Left
 - C Station 503+520 Left to Station 503+800 Left

Refer to Appendix C for the station locations on the preliminary roadway plans. Exact locations will be determined during final design.

- All asphalt not reused as part of the project will be removed from the site or incorporated into roadway embankments, and the roadbed reshaped, scarified, and revegetated. All abandoned sections of old highway will be obliterated and made to blend with the existing landscape.
- Rock outcrops within the project limits will be left in place if stable and do not create a hazard to the traveling public, interfere with construction, or look out of place in the natural landscape.
- The clearing limits within National Forest lands shall be irregular and staked by the contractor for approval by the Coconino National Forest and ADOT prior to the start of clearing. Limits of clearing will generally extend from the top of slope cuts (including rounding) to the toe of fills. Straight clearing lines will be avoided where possible by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Tree wells and/or other techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by ADOT, the Coconino National Forest, and the City of Sedona.
- The roadway medians and all fill slopes (including material waste areas) and cut slopes flatter than 1:2 (vertical to horizontal) will be planted with drought-tolerant native species using densities similar to adjacent undisturbed areas. No trees will be planted in the median. The medians and fill slopes will not have permanent irrigation systems. ADOT will maintain the median plantings between MP 304.5 to MP 305.1 and MP 307.2 to MP 309.6. In the bifurcated roadway, ADOT will maintain plantings within the highway right-of-way/easement area.

- ADOT will work with the City of Sedona to design sign support systems that are “in character” with the urban area if traffic control structures are required as part of the improvements within the city limits.

The Parkways, Historic and Scenic Roads Advisory Committee has reviewed the evaluation of the potential impacts on the Red Rock Scenic Road as described within this EA. The Committee has concurred, that with the implementation of the mitigation measures, the existing Red Rock Scenic Road designation will be maintained within the study limits. A copy of their concurrence letter is included in Appendix E.

Therefore, the roadway improvements overall will have no substantial impacts to visual quality and a substantial impact to the visual character along portions of the roadway corridor through National Forest lands.

M. Drainage and Floodplain Considerations

SR 179 traverses an upland area containing well-defined drainages that generally flow in a west-southwesterly direction. The off-site storm water runoff generally flows in stable watercourses that cross under the existing SR 179 roadway at approximately 71 locations from 2.7 kilometers (1.7 miles) south of the Village of Oak Creek to SR 89A within the City of Sedona. South of Bell Rock, the drainage structures discharge easterly to southeasterly into Jacks Canyon, a tributary of Wet Beaver Creek. A major drainage divide occurs at Bell Rock between the Oak Creek Watershed and the Wet Beaver Creek Watershed. North of Bell Rock, the majority of drainage structures discharge westerly toward Oak Creek. Existing drainage facilities include a three-span steel bridge over Oak Creek at MP 313.1, ten box culverts, and 61 corrugated metal pipe culverts. Five of the box culverts consist of an original stone-faced headwall structure with a concrete extension on one end.

Localized drainage problems associated with the existing roadway include scour at culvert outlets, sedimentation of some culverts, and downstream west bank erosion at the Oak Creek bridge. Severe erosion and downstream degradation have been observed at several large culverts. High flows within Oak Creek occur mainly during the spring snowmelt. These flows carry debris produced by the upstream forest and move a large amount of boulders, cobbles, and sand due to the steep channel gradient.

Flood Insurance Rate Maps (FIRM) have been prepared and published by the Federal Emergency Management Agency (FEMA) for the SR 179 study area (see *Final Location/Design Concept Report, SR 179: Village of Oak Creek - Sedona*, ADOT, 2002b). Detailed flood insurance studies for the unincorporated areas of Coconino and Yavapai counties were published in September 1990 and May 1992, respectively. These studies cover Oak Creek and Jacks Canyon. In general, the majority of the project is within Zone C, which is defined as “Areas of minimal flooding.” Zones A, A7, A10, and B designations have been determined for Oak Creek and Jacks Canyon. Zone A is defined as “areas of 100-year flood; base flood elevations and flood hazard factors not determined.” Zone A7 and A10 are defined as “areas of 100-year flood; base flood elevations and flood hazard factors determined.” Zone B is defined as “areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than 0.3-meter (1-foot) or where the contributing drainage area is less than 2.6 square kilometer (1 square mile); or areas protected by levees from the base flood.” The FEMA 100-year floodplains for Oak Creek and Jacks Canyon are shown in Figure 29 on page 88. Just below the SR 179 bridge, Oak Creek has a drainage area of 603.5 square kilometers (233 square miles). Structural encroachments into this floodplain have occurred both upstream and downstream of the existing SR 179 crossing. Significant flooding has occurred on Oak Creek several times in the past. In February 1993, the peak discharge was 657 cubic meters per second (23,200 cubic feet per second), which is greater than that of a 50-year storm. Flow during a 100-year storm will overtop the existing

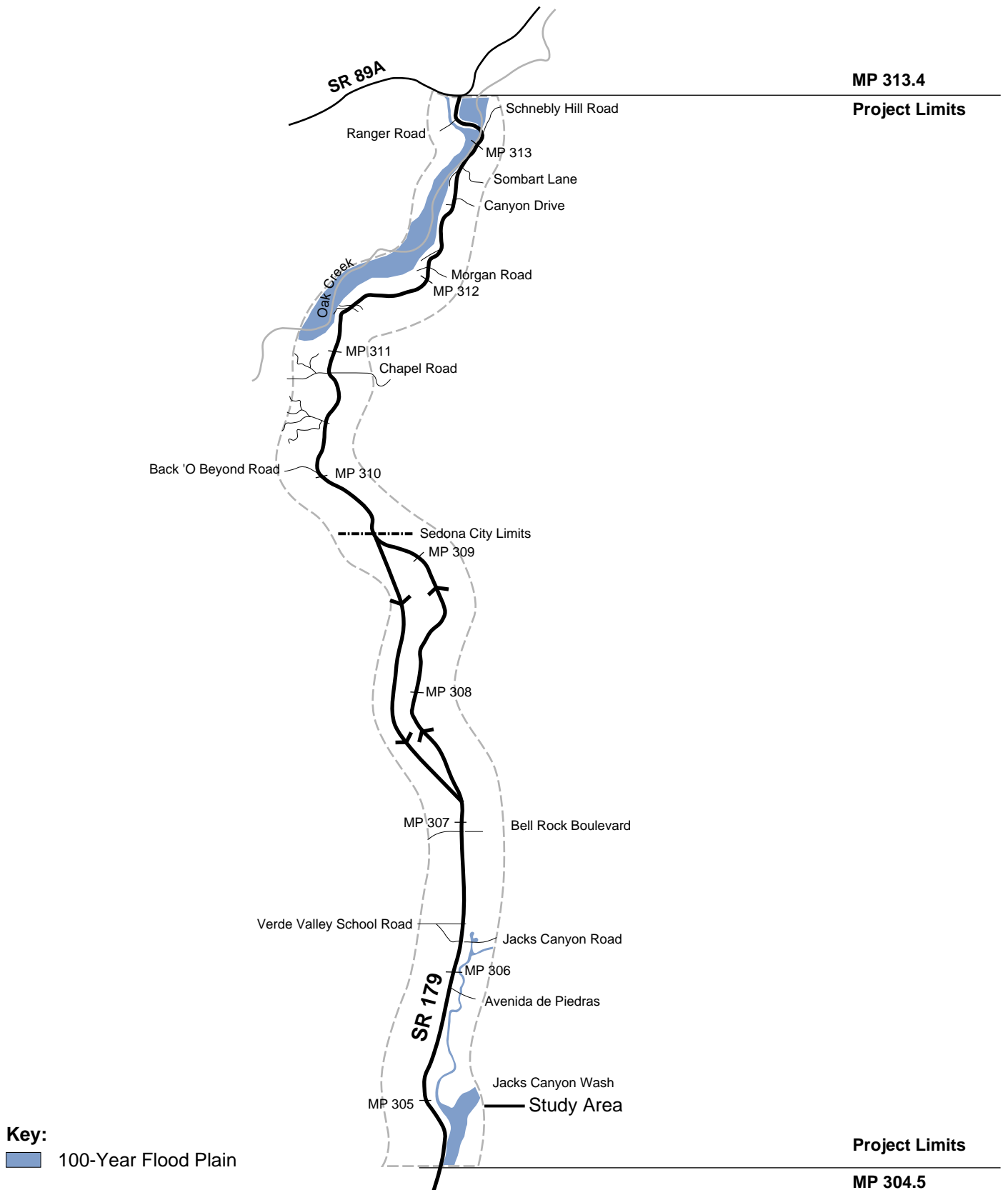


Figure 29. Federal Emergency Management Agency 100-year floodplain



bridge and roadway and that of a 50-year storm will pass through the existing bridge with 0.8 meter (2.5 feet) of clearance.

Any drainage structures and roadway improvements that encroach into the designated floodplain will be designed to meet ADOT criteria for a 50-year storm event for protection of the highway from flooding. The drainage structures and roadway improvements will also meet FHWA guidelines for a 100-year frequency event for protection of adjacent private properties as required by 23 CFR § 650A. The project will meet the FHWA requirements contained in 23 CFR § 650A. Existing cross culverts that meet current ADOT standards will be incorporated into the widened roadway through extension to one or both sides of the roadway as necessary.

New storm drain systems will be required within the Village of Oak Creek and within the urban section of Sedona from the SR 89A intersection south for a distance of 5.6 kilometers (3.5 miles). Due to the rolling terrain within the city of Sedona, the storm drain system will consist of numerous small systems that discharge to local cross culverts. Outfalls will be established at existing culvert crossings where possible. A new outfall to Jacks Canyon will be established to the east along Jacks Canyon Road. Drainage runoff, both on-site and off-site, will be allowed to travel in current patterns. Effects to the floodplains on the FIRM will be negligible with the improvements. No effects are anticipated to the base flood elevations with the improvements to SR 179.

In summary, there will be no substantial impact to the floodplains because the roadway improvements will not substantially modify the topography in the study area and because drainage runoff will be allowed to travel in current patterns.

N. Water Resources, Section 404 of the Clean Water Act, and National Pollutant Discharge Elimination System

Oak Creek is a perennial stream originating at the confluence of Sterling Canyon and Pumphouse Wash to the north of Sedona and flowing southerly to the Verde River. Oak Creek is fed by springs, snowmelt, and storm water runoff. Oak Creek was designated as a Unique Water by the Arizona Water Quality Control Council in April 1981 because it is considered to have exceptional recreational and ecological importance. Stringent water quality standards protect Oak Creek from degradation. However, water quality is affected by streamside recreation usage, specifically high fecal coliform counts that occur during the summer.

In 1996, COE field-delineated the jurisdictional limits for Jacks Canyon and Oak Creek. COE reviewed this 1996 jurisdictional delineation and determined that the delineation will remain valid and in effect until March 2006, unless an unusual flood event occurs. Coordination with COE indicates the improvements will fall within the scope of various nationwide permits of Section 404 of the Clean Water Act. Each crossing, considered a single and complete crossing of a water of the United States, will disturb less than 0.2 hectare (0.5 acre), and only three crossings will disturb more than 0.04 hectare (0.1 acre). The reconstruction and/or placing of box culverts within the washes will require a Nationwide Permit Number 14, "Linear Transportation Crossing." The widening of the existing Oak Creek bridge will also require a Nationwide Permit Number 13, "Bank Stabilization," for the installation of riprap bank protection, and a Nationwide Permit Number 33, "Temporary Construction, Access and Dewatering." The construction of the new bridge along the bifurcated southbound roadway will also require a Nationwide Permit Number 14. Because of the Unique Water status of Oak Creek, an Individual 401 Water Quality Certification will be required from ADEQ. The terms and conditions of COE's Nationwide 404 Permits shall be followed by the contractor for work affecting Oak Creek, Jacks Canyon, and any of the unnamed washes within the study area that are under the jurisdiction of COE (see Appendix I). ADOT EPG will process any required Section 401/404 permits through COE. All required Section 401/404 permits will be obtained by ADOT prior to construction.

To minimize impacts to waters of the United States, the project will use retaining walls to eliminate permanent encroachment into parallel segments of waters of the U.S. and will maintain the perpendicular crossing of Oak Creek. On Jacks Canyon, there will be temporary construction disturbance of 0.03 hectare (0.07 acre) and a permanent disturbance of 0.0008 hectare (0.002 acre). On Oak Creek, construction focusing on retaining walls and the bridge will result in temporary disturbances.

A small portion of the bridge construction disturbance will be permanent for the extension of the existing piers. Total project disturbance to Oak Creek will be 0.1 hectare (0.3 acre). The remaining 69 wash crossing culverts will be extended or replaced as necessary to meet current ADOT standards. These culverts, ranging in size from 61-centimeter (24-inch) circular pipes to a triple cell (3.7-meter by 3.7-meter [12-foot by 12-foot]) concrete box culvert, will have disturbances ranging from 0.0008 hectare to 0.06 hectare (0.002 acre to 0.150 acre). These disturbances are based on an office review of aerial mapping and existing culvert size and will be re-evaluated during final design.

A Storm Water Pollution Prevention Plan (SWPPP) will be prepared and will incorporate temporary erosion control measures during construction, permanent erosion control measures when the project is completed, and good housekeeping practices for the control and prevention of release of water pollutants. The SWPPP will be developed as part of the National Pollutant Discharge Elimination System (NPDES) general permit. ADOT Roadside Development Section will determine who will prepare the SWPPP. Under Section 402(p) of the Clean Water Act, an NPDES permit is required for all construction activities when 0.4 or more hectares (1 or more acres) of land are expected to undergo excavation and/or grading during construction. The main objectives of the permitting program are to reduce erosion, minimize sedimentation, and eliminate the discharge of non-storm water pollutants. The project will affect more than 0.4 hectare (1 acre); therefore, a permit will be required prior to construction. A Notice of Intent will be submitted to the U.S. Environmental Protection Agency (EPA) at least 48 hours prior to the start of construction by the ADOT District Construction Office and the contractor. Copies will also be sent to ADEQ. The District Office and the contractor will also submit a Notice of Termination to EPA and copies to ADEQ.

Erosion control will be an important component of the improvements because of the need to protect downstream watercourses. The SWPPP will establish the anticipated techniques to control erosion and sediment discharge from any construction area. Possible temporary erosion control techniques may include hay bales, sand bags, earth berms, silt fences, geotextile fabrics, and bioengineering (enhanced vegetation) techniques. Examples of permanent erosion control measures that may be used are the riprap of cut and fill transition areas and headwall and pipe inlet/outlet rock mulch treatment.

ADOT District will monitor all mitigation measures encompassing sedimentation and erosion control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas.

Bank stabilization in the form of natural-looking riprap or rock-filled baskets will minimize bank erosion at the Oak Creek Bridge. Protection of water quality of Oak Creek will include the temporary installation of coffer dams with water-impenetrable fabric for construction of new pilings and embankment. These coffer dams will be dewatered prior to piling and pier work and monitored for integrity.

The effect of sedimentation will be greatest during the construction and revegetation period. Potential sources of erodible material resulting from the highway construction process include loose fill material in adjacent drainage features, disturbed earth from roadway obliteration, and backfilled soil around roadway and drainage structures. Because the surface soils are generally fine grained, some sediment transport is expected after

construction. The “temporary” erosion control measures will be left in place until ADOT determines that the site is stabilized as identified in the SWPPP.

The volume of vehicles traveling the highway determines the amount of hydrocarbons and heavy metals deposited on the roadway surface and in adjacent areas. These pollutants are transported by rainfall runoff and affect the water quality of the immediate downstream portions of the drains. Because pollutants will increase with more traffic, and traffic is projected to increase regardless of whether or not the project is constructed, the impact of the project on the quality of storm water runoff is considered to be negligible.

During construction of the project, care shall be taken to ensure that construction materials are not introduced into the washes, in accordance with *Arizona Department of Transportation’s Standard Specifications for Road and Bridge Construction* Section 104.09 (2000 Edition) and the Water Quality Standards in Title 18, Chapter 11 of the Arizona Administrative Code as administered by ADEQ. Excess concrete, curing agents, form work, waste materials, lubricants, and fuel will not be disposed of within the project boundaries. In the event of accidental chemical spills during construction, the site will be cleaned up to prevent chemical introduction into the surface or groundwater systems. Incidents involving hazardous materials will be coordinated by ADOT’s Engineer. These measures will help protect both surface and groundwater.

Because of the Unique Water status of Oak Creek, additional mitigation measures will be necessary to ensure the protection of this resource. Construction activities adjacent to Oak Creek will be coordinated with all of the regulatory and affected agencies in addition to ADOT. Roadway catch basins that discharge directly into Oak Creek will be constructed with skimmers (oil/water separators) to contain any hydrocarbons, debris, and sediment. ADOT will be responsible for the maintenance of the roadway catch basins. The contractor shall not use water from Oak Creek as a water supply for construction activities.

The existing bridge will remain in place to reduce impacts. Construction activities for the bridge at Oak Creek will take place during low-flow periods, from August through December, to avoid potential impacts to spawning fish. Any required water diversion structure shall allow water to continually flow to permit fish movement up-and downstream. The diversion structure must have the capability of being lowered or readily removed in case of a high-water event so that it will not be washed downstream. Reconstruction of the bridge will require the use of a catchment mechanism under the structure to intercept construction material inadvertently dropped from the structure. Runoff from the finished bridge deck will not discharge directly into Oak Creek. Storm water runoff from the deck will be directed to a holding tank with the capacity for a 25-year on-site runoff event with a 10 percent freeboard for hazardous material purposes. ADOT will be responsible for the maintenance of the storm water holding tank at the Oak Creek bridge. Photographic documentation of the site conditions prior to construction of the Oak Creek bridge will be made by ADOT and included in the revegetation plans for use during site restoration.

ADEQ shall be notified by the contractor before project construction begins.

During the retaining wall construction along Oak Creek, a sediment filter fence will be installed to contain and filter sediment during runoff periods. The construction of a settling pond should be evaluated during final design in conjunction with the filter fence to filter sediment. According to ADEQ, turbidity downstream from the construction site in Oak Creek cannot be increased by more than three Nephelometric Turbidity Units, the standard method of measuring turbidity, during construction. ADEQ will monitor turbidity by periodically taking measurements 30 meters (100 feet) upstream and downstream of the construction site.

ADOT will employ best management practices guidelines to minimize sediment from runoff periods from entering Oak Creek during construction and during bank stabilization and revegetation after the widening of the bridge at Oak Creek.

In summary, there will be no substantial impacts to the water resources within the study limits because of the mitigation measures that will be implemented to protect Oak Creek as a Unique Water and the 404 permits and 401 water quality certification conditions that will be required for any disturbances to waters of the United States. ADEQ Water Quality has reviewed this project and is in general agreement with the work. A NPDES permit will also be required along with the applicable notices to ADEQ and ADOT EPG.

O. Wetlands

Wetlands were identified as occurring within the study area by COE. The wetlands are associated with Jacks Canyon near MP 305 (Station 490+800). A retaining wall will be constructed to prevent any encroachment of the improvements from disturbing the wetlands. This wall will keep any embankment material from the roadway fill slope away from the wetlands. Therefore, the improvements will not impact the wetlands.

P. Materials Sources

Materials sources within the vicinity of the study area are limited. There are no known materials sources on the adjacent National Forest lands. ADOT files identify as many as 17 different noncommercial material sources within 8 kilometers (5 miles) of the project limits that were previously used or considered for past projects. None of these sites are currently under lease to ADOT. Commercial sources capable of supplying the required types and amounts of material for this project are located in Camp Verde, Flagstaff, and Cottonwood. The contractor may use materials from either private, commercial, or ADOT sources; in any case, the sources shall have separate environmental approvals from ADOT according to Section 1001-2 of *Arizona Department of Transportation Standard Specifications for Road and Bridge Construction* (2000 Edition).

Q. Construction Debris Disposal

Excess waste material and construction debris shall be disposed of at sites supplied by the contractor. Disposal shall be made at either Municipal Landfills approved under Title D of the Resource Conservation and Recovery Act (RCRA), Construction Debris Landfills approved under Article 3 of the Ariz. Rev. Stat. Ann. § 49-241 (Aqua Protection Permit) administered by ADEQ, or Inert Landfills. Inert landfills are not regulated by ADEQ. There are no Yavapai or Coconino county regulations governing the disposal of construction debris. There are no designated construction debris disposal sites on National Forest lands. The City of Sedona will allow for disposal of construction debris after an approved grading and building permit is issued.

R. Hazardous Materials

A Preliminary Initial Site Assessment (PISA) was conducted in June 1995 and updated in April 2002 for the presence of hazardous materials within the project limits. The assessment included a field reconnaissance (visually assessing the existing right-of-way and adjacent parcels for recognized environmental concerns), review of applicable federal and state agency records, and a review of aerial photographs. Records reviewed for the project included the EPA Toxic Release Inventory System list; the Superfund Amendments and

Reauthorization Act (SARA) list; the Federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) list; the RCRA database; ADEQ Arizona CERCLA Information and Data System (ACIDS) list; the Arizona Water Quality Assurance Revolving Fund (WQARF) project priority list; ADEQ Drywell Registration list; the ADEQ Hazardous Materials Incident Logbook; the Arizona Directory of Closed Waste Landfills and Closed Solid Waste Dumps; the Arizona Directory of Public Municipal Solid Waste and Rubbish Landfills; and the ADEQ Leaking Underground Storage Tanks (LUST) and Underground Storage Tanks (UST) lists.

Five underground storage tanks registered with the ADEQ were encountered within project limits. Three of these facilities appear in the LUST database. The remaining two do not represent a recognized environmental concern under the current conditions and project scope. The field survey indicated that the LUST site associated with the existing Village Square Chevron Station at the junction of SR 179 and SR 89A in Sedona has the potential to affect the project. ADOT EPG will review final plans relative to the ADEQ LUST database at the time final design plans are prepared to properly assess the potential impact. Two closed LUST sites were encountered within the project limits; these facilities do not represent a recognized environmental concern under current conditions and project scope.

Under the current scope of work for the project, additional assessments for recognized environmental conditions are not required within existing project limits, based on the updated visual and database review. EPG's Hazardous Materials team will review the ADEQ UST and LUST databases for changes in status of existing facilities or the addition of new facilities when project plans are finalized. Therefore, there will be no impact to hazardous materials.

No other hazardous materials are suspected in the study area as a result of the investigation. According to *Arizona Department of Transportation's Standard Specifications for Road and Bridge Construction*, Section 107 Sanitary, Health and Safety Provisions (2000 Edition), if previously unidentified or suspect hazardous materials are encountered during construction, work shall stop at that location and the ADOT Engineer shall be contacted to arrange for proper assessment, treatment, or disposal of those materials. Such locations shall be investigated and proper action implemented prior to the continuation of work in that location.

S. Recreation

Oak Creek Canyon and the Sedona area are well known within Arizona, as well as within the United States, for their diverse recreation opportunities. Residents and visitors alike come to Sedona to hike and view the red rock formations and Oak Creek Canyon. Recreation use is predominately dispersed-use activities such as scenic viewing, hiking, mountain biking, horseback riding, photography, camping, and bird watching. Because the area adjacent to the highway contains many of the signature rock formations and Wilderness areas associated with Sedona, these National Forest lands have a high recreation and scenic resource value. In addition, the State of Arizona has designated the highway from MP 302.5 to MP 310 as the Red Rock Scenic Road.

Numerous motorized and non-motorized vehicle trails and trailheads are abundant in the vicinity of the study area. The City of Sedona has adopted a *Trails and Urban Pathways Plan* (revised June 1998), which outlines the city's long range development of a series of bikeway, pedestrian, equestrian, non-motorized vehicle trails, and trailheads.

The City's Perimeter Loop Trail/H. T. Trail crosses under SR 179 near MP 309.9, which uses the existing drainage area and box culvert. The Templeton Trail also uses the existing box culvert to cross SR 179 near MP 308.4. The extensions of the existing culverts and the new culverts that will be constructed along the bifurcated section will be sized to continue their current accommodation of pedestrian and mountain bike use. In addition to these culverts that accommodate trail use (at MP 308.4 and MP 309.9), other culverts may also be extended.

The highway also provides access to numerous recreation staging areas or trailheads. These include Sombart Lane Trailhead, Broken Arrow Trailhead, Templeton Trailhead, and North and South Bell Rock Pathway Trailheads. These and other major recreation facilities are shown on Figure 30 on page 95.

A 5.6-kilometer (3.5-mile) recreation path has been completed by the Coconino National Forest between the Village of Oak Creek and the City of Sedona. The path is a segment of the Red Rock Pathways, a system of recreational paths, trails, and trailheads, designed to connect the Village of Oak Creek, Sedona, and Red Rock State Park in a loop. A portion of the path, known as the Bell Rock Trail, parallels SR 179 to the east and has recently been constructed. The potential future scenic pull-outs at MP 309.2 and the scenic pull-outs at MP 307.3, MP 308.3, and MP 309.9 will also be used as trailheads for the Bell Rock Pathway. The Templeton Trail currently being planned by the Coconino National Forest on the west side of SR 179 will make use of the southbound pull-out at MP 308.4 and the potential future scenic pull-out at MP 309.1.

One other established multi-use facility is located within the study area. Bell Rock Vista is located at MP 308.2 and consists of an eight-car parking area, restroom facility, and trail to a vista point. According to the Coconino National Forest, over 29,500 people visited Bell Rock in 1995.

The Coconino National Forest uses the Recreation Opportunity Spectrum (ROS) to provide a framework for defining and rating classes of outdoor recreation environments, activities, and experience opportunities. The system's premise is that recreation users choose a specific setting for a particular activity or set of activities to have a desired experience. Six settings or classes have been delineated ranging from pristine undisturbed landscapes to areas heavily impacted by human presence. The ROS class designations include: Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, Roaded Natural, Rural, and Urban. All but the Primitive class are found within the study area. One small portion along SR 179, near Bell Rock, is classified as Semi-primitive Non-motorized. "Full access" roads are designated as unacceptable in this area in order to limit motorized access to Bell Rock and the Munds Mountain Wilderness Area immediately adjacent to the highway. No changes are anticipated in the overall ROS designations. Existing National Forest roads and trails will be maintained in relation to recreational opportunities currently provided.

The scenic pull-out improvements will provide safer vehicular and pedestrian access to recreation sites than existing conditions. Except from the scenic pull-outs in the median (MP 309.1) in the bifurcated section and at the South Bell Rock Pathway Trailhead pull-out (MP 307.3), left turns from the pull-outs onto SR 179 will be prohibited to maintain satisfactory levels of service along the highway. The pull-outs will be beneficial to the Bell Rock Pathways and planned trail system by providing parking and safe access to the trails. However, the scenic pull-outs will also increase demand on the National Forest lands. Demand will be placed on lands adjacent to each pull-out due to the potential for illegal overnight camping and the concentration of people in one area. This will increase the need for restroom facilities, create a more informal dispersed use radiating from the pull-out sites on trails/paths, and degrade the natural setting. The new pull-outs will provide increased opportunities to view and photograph new vistas. Motorists using the pull-outs as a point to stop and take pictures or use the restroom facilities will not be charged a user fee. However, according to new policies implemented by the Coconino National Forest, a fee will be required of visitors who park at the pull-outs with the intent of recreating on Coconino National Forest lands.

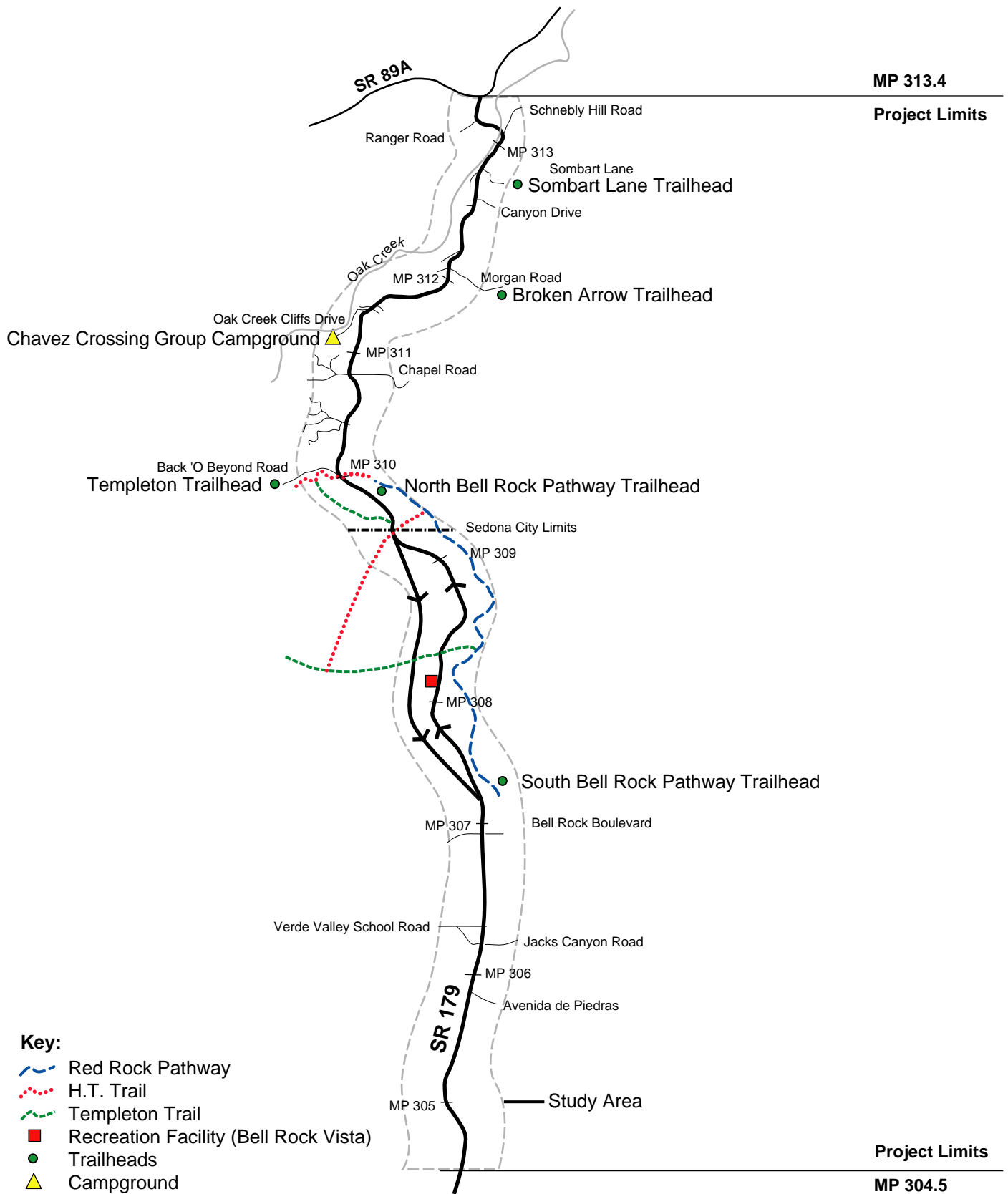


Figure 30. Major recreation facilities



The expansion of the parking areas at the two Bell Rock Trailheads (MP 307.3 and MP 309.9) will not be done at the same time. Construction activities at the trailheads/scenic pull-outs will take place between November 1 to April 1. Information signs will be placed along SR 179 to inform people of the closure of the trailheads/scenic pull-outs.

The expanded roadway will also provide a safer facility for bicyclists. The paved outside shoulder and wider outside travel lane can more safely accommodate the existing bicyclist use of the highway than current conditions. The Bell Rock Pathway was planned adjacent to the existing highway alignment. Therefore, the construction of an improved roadway will not adversely affect the location or use of the pathway. Linking with the existing Bell Rock Pathway, a pedestrian path on the east side of SR 179 will be constructed to connect the Village of Oak Creek (MP 305.9) to Sedona (MP 313.4) and on both sides of SR 179 from Arrow Drive (MP 312.0) to SR 89A (MP 313.4)

Bell Rock Vista, a multi-use facility, will be displaced by the roadway improvements and replaced by a pair of new facilities located immediately east and west of the existing facility. The two scenic/rest area pull-outs (MP 308.3 and MP 308.4) will be connected by a one-way road across the median that will allow southbound travelers to reach the east pull-out area. The east or northbound pull-out (MP 308.3) will include restroom facilities. The restroom facility will be appropriately sized, sited, and designed to accommodate the expected use of the pull-out as well as to complement the scenic and other site characteristics. The design and construction of the restroom facility will be completed by the Coconino National Forest with design and construction funding from ADOT. Although the existing facility will be eliminated, the loss of the existing multi-use facility is not considered to be a substantial adverse impact for the following reasons. The facilities at Bell Rock Vista will be relocated near to the existing location, and the recreation activities, features, and attributes associated with this facility will not change. The existing facility does not currently meet the parking demand for the Bell Rock area much less have the ability to meet future recreation use demand.

The new pull-outs will provide safer pedestrian and parking circulation than the existing condition, because pedestrians must currently cross SR 179 to get to Bell Rock. The scenic pull-out will have better scenic viewing and photographic opportunities as compared to the present site. Access to a pull-out (either the existing facility or one of the new pull-outs) will continue during construction because the roadway improvements will be built in phases.

Temporary signs and flashing lights will be placed at the H. T. Trail culvert near MP 309.9 to warn motorists of pedestrians crossing the highway. Signs will be posted at the Templeton and the north Red Rock Pathway trailheads, alerting the public on either side of this portion of the trail about the construction activities. During active construction, traffic control personnel will be present to assist trail users who want to cross SR 179 at this location.

In summary, the roadway and scenic pull-out improvements will provide an overall beneficial impact on recreation within the study limits. Safer vehicular, bicyclist, and pedestrian access and increased opportunities to view and photograph new vistas will be provided. The pull-outs will be beneficial to the Bell Rock Pathways and planned trail system by providing parking and safer access to the trails. Therefore, there will be no substantial impact to existing or planned recreation facilities.

T. Wilderness Area

Munds Mountain Wilderness Area lies immediately east of SR 179 near Bell Rock and is within 80 meters (262 feet) of the highway between MP 307.8 and MP 308.3 (Figure 31 on page 97). SR 179 is within

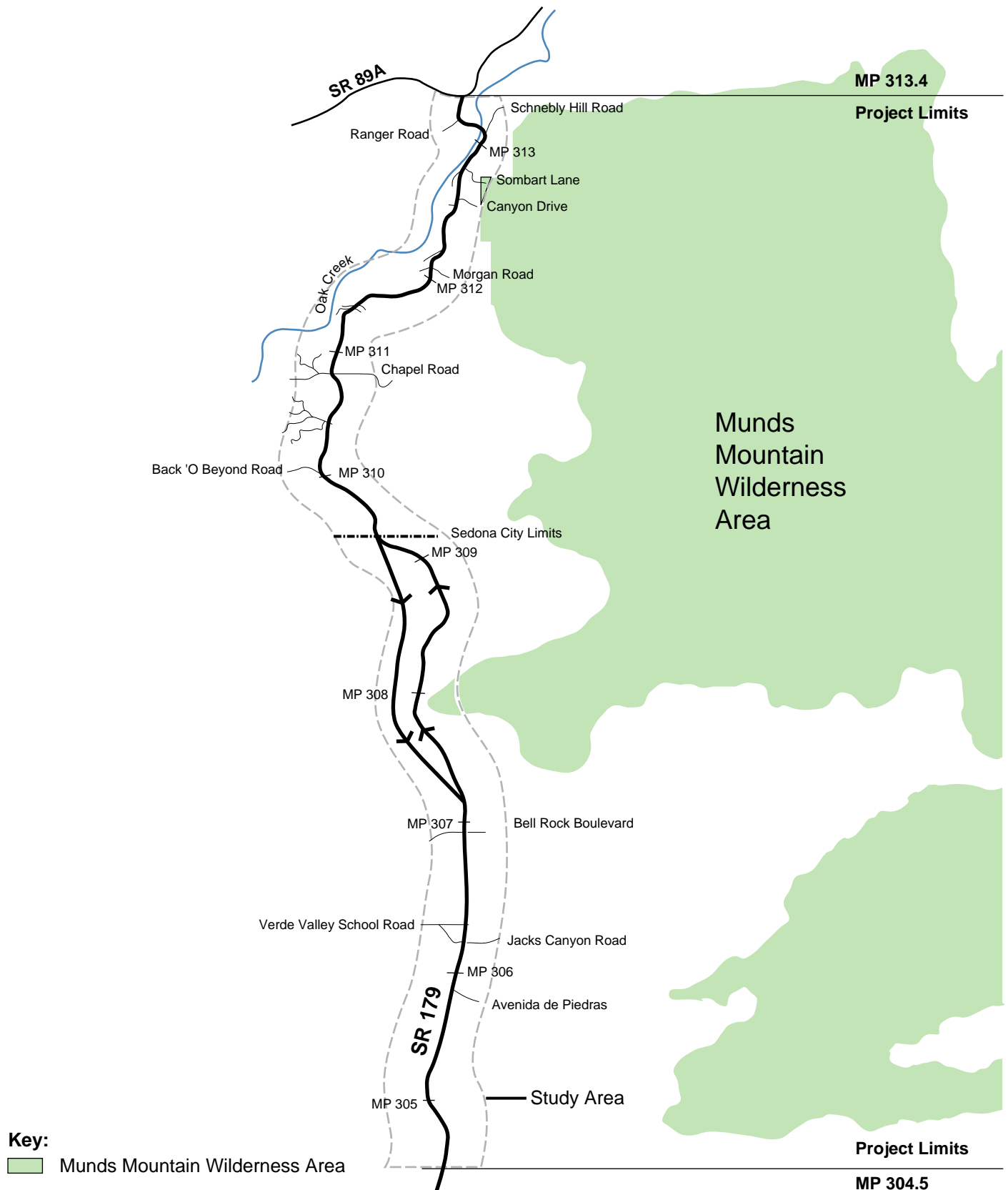


Figure 31. Munds Mountain Wilderness Area

approximately 137 meters (450 feet) of the Wilderness boundary near MP 312.9. The deep drainages and rugged nature of the Wilderness area offer many opportunities for primitive recreation activities. Spectacular red cliffs, outstanding riparian habitat, great diversity of wildlife species, and many prehistoric cultural sites are found within the 7,410 hectares (18,311 acres) of the Munds Mountain Wilderness Area. Access to the Wilderness area is from SR 179 near Bell Rock, Woods Canyon Road, Broken Arrow Road, Schnebly Hill Road, Sombart Lane, and Jacks Canyon Road.

The northbound scenic pull-out located near MP 308.3 is near the Wilderness boundary. Because tour bus parking would have the potential to disperse large groups at this Wilderness access point, tour bus parking will not be allowed at the northbound MP 308.3 pull-out. Signs will be posted to prohibit tour buses from parking at this northbound pull-out. Tour buses will be directed to the scenic pull-out located at MP 307.3, which is located approximately 1.6 kilometers (1 mile) to the south, close by for viewing Bell Rock. Noise levels were evaluated at the closest point of the Wilderness area boundary to the alignment. The projected noise levels will be below the threshold of FHWA NAC. No long-term adverse impacts to the Munds Mountain Wilderness Area are anticipated to occur from the improvements. Designated scenic pull-outs and parking prohibited along the highways will reduce Wilderness damage from “social trails” and uninformed visitors. Construction activities will minimally increase noise levels for short periods of time.

In summary, the roadway improvements will have no substantial impact on the Munds Mountain Wilderness Area because designated scenic pull-outs and prohibited parking along SR 179 will reduce damage caused by “social trails” and uninformed visitors. In addition, the northbound scenic pull-out located near MP 308.3, will have posted signs to prohibit tour buses from parking at this location.

U. Summary of Environmental Impacts

Table 14 offers a summary of the impacts on the various resources described in this Section, as well as the mitigation and standard practices to be employed to reduce these impacts.

Table 14. Results of environmental analysis

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
Ownership, Jurisdiction, and Land Use	No substantial impact.	<p>ADOT will maintain existing access to permitted driveways and side roads during construction.</p> <p>Private property owners will be compensated at market value for land that is acquired for project right-of-way, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended in 1987. Replacement housing will meet the requirements of 49 CFR § 24 and of the Ariz. Rev. Stat. Ann. § 28-1841, as contained in the 1995–1996 edition of the Arizona Criminal and Traffic Law Manual.</p> <p>ADOT will coordinate with the appropriate utility companies on facility relocations during final design. Utility companies with prior rights will be compensated according to ADOT policies and guidelines.</p>
Social and Economic Considerations	No substantial impact.	<p>The contractor shall install fencing on National Forest lands prior to construction to keep cattle from accessing the highway and limit off-road vehicular access.</p> <p>During the design phase, ADOT will evaluate working during the evening hours, the timing of the construction (avoiding peak tourism season), and restricting construction to weekdays.</p> <p>ADOT will work with the Big Park Regional Coordinating Council, Village of Oak Creek, City of Sedona's Citizens Advisory Committee, and other appropriate organizations during the final engineering design process to address concerns related to construction work scheduling and aesthetic design issues.</p> <p>The contractor shall notify the public of the start of construction by placing notices in local newspapers 14 days prior to the beginning of construction activities affecting traffic flow or access. The contractor shall also notify emergency services such as police and fire departments before construction activities begin as well as maintain continued coordination throughout construction.</p> <p>ADOT will maintain existing access to properties during construction.</p> <p>The contractor shall maintain traffic on the Oak Creek bridge during construction.</p> <p>Property owners will be compensated at market value for property acquired for project right-of-way in accordance with the Uniform Relocation Assistance and Real Property</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		Acquisition Policies Act, as amended in 1987. Replacement housing will meet the requirements of 49 CFR § 24 and of the Ariz. Rev. Stat. Ann. § 28-1841, as contained in the 1995–1996 edition of the Arizona Criminal and Traffic Law Manual.
Title VI/ Environmental Justice	No impact.	
Cultural Resources	No impact.	<p>Five sites were determined initially as potentially eligible for listing on the NRHP. After testing of these sites, they were determined to be ineligible for the NRHP.</p> <p>According to Section 107.05 of Arizona Department of Transportation Standard Specifications for Road and Bridge Construction (Edition 2000), if previously unidentified cultural resources are discovered during construction, the contractor shall stop work immediately at the location and take all reasonable steps to secure the preservation of those features and the ADOT Engineer will be notified. ADOT will, in turn, notify the appropriate agency(ies) to evaluate the importance of the resources.</p>
Section 4(f) Resources	No substantial impact.	<p>Expansion of the parking areas at the two Bell Rock Pathway Trailheads (MP 307.3 and MP 309.9) will not be done at the same time. Construction activities at the trailheads/scenic pull-outs will take place between November 1 and April 1. Information signs will be placed along SR 179 to inform people of the closure of the trailheads/scenic pull-outs.</p> <p>The majority of the construction activities adjacent to the Bell Rock Pathway near MP 307.3 and MP 309.9 will be conducted during the weekdays and not on the weekends or holidays when there is a higher volume of trail use.</p> <p>Temporary signs and flashing lights will be placed at the H. T. Trail culvert near MP 309.9 and at the Templeton Trail culvert near MP 308.4 to warn motorists of pedestrians crossing the highway. Signs will be posted at the Templeton and North Bell Rock Pathway trailheads alerting the public on either side of this portion of the trail about the construction activities. During active construction, traffic control personnel will be present to assist trail users who want to cross SR 179 at these locations.</p> <p>Any extensions of the existing concrete box culverts at MP 309.9 and MP 308.4 will be constructed at the same size or larger to accommodate the existing pedestrian and bicycle use at trail crossings.</p>
Air Quality	No substantial impact.	Dust generated from construction activities must be controlled in accordance with the <i>Arizona Department of</i>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<i>Transportation Standard Specifications for Road and Bridge Construction</i> , Section 104.08 (2000 Edition), special provisions, and local rules or ordinances.
Noise	No substantial impact.	<p>The contractor will be required to meet the noise abatement requirements of Section 104.08 of the <i>Arizona Department of Transportation Standard Specifications for Road and Bridge Construction</i> (2000 Edition) during the roadway construction.</p> <p>Final locations, lengths, and heights of noise abatement measures will be determined in final design.</p>
Landscape/ Vegetation Removal/ Invasive Species	No substantial impact.	<p>To minimize ground disturbance, construction access on National Forest lands shall be pre-approved by the Coconino National Forest and shown on the project plans. Any equipment yards, batch plants or other construction-related activities shall occur within the designated limits of disturbance. No construction vehicle movement shall occur on National Forest lands outside the construction access limits. On non-National Forest lands, the contractor shall obtain written permission from the ADOT District Engineer for construction-related activities outside the designated limits of disturbance.</p> <p>Vegetation will be preserved and protected outside of the specified clearing limits. The contractor shall remove trees only when specifically authorized to do so by ADOT and will avoid damaging vegetation that is to remain in place.</p> <p>A resource protection plan will be included in the construction documents to identify sensitive areas such as riparian areas and natural rock outcrops within the project limits that will need to be protected from construction impacts.</p> <p>Any tree or shrub planted will be irrigated for a two-year establishment period.</p> <p>Revegetation will occur in a progressive manner once a portion of the roadway improvements has been completed.</p> <p>On National Forest lands, the following plant species will be salvaged and transplanted within the project limits: pinyon pine, juniper, turbinella (scrub) oak, and manzanita. The plant quantity per plant species and plant sizes to be salvaged will be agreed to during final design by ADOT and the Coconino National Forest.</p> <p>Slashings (tree trunks, branches, stumps, cacti and other vegetation) and excess rock and soil material resulting from clearing operations on National Forest land will be deposited in sites approved by the Coconino National Forest.</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<p>Any fill, seed, or mulch material brought in from off-site will be free of invasive species. Construction equipment will be free of invasive species and toxic materials.</p> <p>Invasive species will be treated prior to construction according to ADOT's Natural Resources Section invasive species management plan. Any necessary treatments will continue following construction completion by ADOT's Natural Resources Section. To prevent the spread of invasive species seed to uncontaminated areas, all earth-moving and hauling equipment will be washed prior to entering or leaving the construction site. Furthermore, all disturbed soils will be seeded using native species to help prevent the reestablishment of invasive species in the future.</p>
Vegetation and Wildlife	No substantial impact.	<p>Wildlife water collection sources will be provided on both the east and west side of the project near MP 308.3 (Station 496+200 northbound) and MP 308.4 southbound (Station 496+400). AGFD will maintain these collection sources after construction.</p> <p>To accommodate wildlife movement in the four AGFD-identified wildlife movement corridors, newly constructed box culverts will be at least 1.2 meters (4 feet) high by 1.2 meters (4 feet) wide.</p> <p>The contractor shall move any riparian reptiles or amphibians (snakes or frogs) encountered during reconstruction of the bridge at Oak Creek out of harm's way.</p> <p>According to Section 107.12 of <i>Arizona Department of Transportation Standard Specifications for Road and Bridge Construction</i> (2000 Edition), the contractor shall comply with all Coconino National Forest requirements including providing maintenance commensurate with the contractor's use of the National Forest roads and trails. In addition, the contractor shall not deface, injure, or destroy trees, shrubs, or private property except as required to complete the construction according to Section 107.11 of <i>Arizona Department of Transportation Standard Specifications for Road and Bridge Construction</i> (2000 Edition).</p>
Wildlife Management Indicator Species	No substantial impact.	<p>Wildlife water collection sources will be provided on both the east and west side of the project near MP 308.3 (Station 496+00 northbound) and MP 308.4 (Station 496+400 southbound). AGFD will maintain these collection sources after construction.</p> <p>To accommodate wildlife movement in the four AGFD-identified wildlife movement corridors, newly constructed box</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		culverts will be at least 1.2 meters (4 feet) high by 1.2 meters (4 feet) wide.
Threatened, Endangered, and Sensitive Species	<p>No impact to federally listed Threatened or Endangered Species.</p> <p>No substantial impact to Forest Sensitive Species.</p>	<p>To further reduce the potential for indirect impacts to designated critical habitat for the loach minnow, ADOT District will monitor all mitigation measures addressing sedimentation and erosion control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas.</p> <p>ADOT EPG will conduct surveys for the Arizona agave 30 days prior to any ground-disturbing activities. If any Arizona agaves are found, consultation with USFWS will be initiated and the Coconino National Forest will be notified if any plants are found on National Forest lands. All Arizona agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest.</p> <p>ADOT EPG will conduct surveys for the Tonto Basin agave 30 days prior to any ground disturbing activities. The Coconino National Forest will be notified if any Tonto Basin agave are found. All Tonto Basin agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest.</p> <p>If blasting is required for construction, no blasting will occur between March 1 and August 31 within a 1.6 kilometer (1-mile) radius of the Gibraltar Rock or Cathedral Rock locations to minimize potential impacts to the peregrine falcon. The no-blast area will be identified on the resource protection plans in final design and approved by the Coconino National Forest.</p> <p>In accordance with the Arizona Native Plant Law, a Notice of Intent to clear protected native plants must be submitted to the Arizona Department of Agriculture at least 60 days prior to any activity, and efforts to salvage, if appropriate, must be delineated. ADOT's Roadside Development Section will submit the Notice of Intent to clear prior to the construction activities. Any salvage efforts on National Forest land will be coordinated with the Coconino National Forest prior to the Notice of Intent.</p>
Visual Resources	No substantial impact to visual quality. Substantial change in the visual character of the roadway between Bell Rock Boulevard in the Village of Oak to Back 'O Beyond Road.	<p><i>ADOT/USFS Guidelines for Highways on National Forest Land</i> (1994) will be followed on National Forest lands.</p> <p>Retaining walls, sound barriers, bridge piers, and abutments will be treated with a patterned or textured surface or faced with native stone accents in critical visual locations as appropriate to the site-specific location. Retaining walls, sound walls, concrete headwalls, bridge piers and abutments, bridge girders, the underside of the bridge deck,</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<p>the exposed outward-facing exterior surfaces of the bridge barriers, and metal handrails on the bridges will be colored with an approved coloring agent that will blend with the natural surroundings. The colors and patterns or textures to be used on concrete surfaces will be coordinated with the Coconino National Forest, ADOT, the City of Sedona, Village of Oak Creek, and other appropriate organizations during final design.</p> <p>Provide a depth of 0.3 meter to 0.6 meter (1–2 feet) of porous fill around trees adjacent to the toes of slopes. Tree wells and/or other techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by ADOT, the Coconino National Forest, and the City of Sedona.</p> <p>Limit signing and other roadside elements such as paddleboards, reflectors, delineators, and object markers to those absolutely essential.</p> <p>Any riprap used in the project will blend with the surrounding rock and exposed soil color.</p> <p>To blend with natural rock features, newly exposed rock faces will incorporate characteristics of the adjacent natural rock to include scale, shape, slope, and fracturing to the extent that is practical and feasible as identified through geotechnical testing and constructability reviews. Exposed rock cuts will be evaluated for chemical staining to blend with adjacent natural rock.</p> <p>Rock outcrops within the project limits will be left in place if stable and do not create a hazard to the traveling public, interfere with construction, or look out of place in the natural landscape.</p> <p>Fill slopes will be 1:2 (vertical to horizontal) with guardrails (weathering steel) in densely vegetated and sensitive areas to provide the least visual impact and to retain as much natural vegetation as possible. Sparsely vegetated and non-sensitive areas will have 1:4 or flatter fill slopes. All fill slopes will be revegetated with native plant species as part of the project using densities similar to adjacent undisturbed areas. The Coconino National Forest will identify the limits of the densely vegetated and sensitive areas.</p> <p>Cut and fill slopes will simulate the terrain of the surrounding area. Cut and fill slopes will be constructed with varied slope ratios to leave an irregular, undulating, or roughened appearance rather than a uniform grade. The slope ratios</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<p>will vary from the top to the bottom of the slope face and from station to station.</p> <p>Boulders excavated during construction will be considered for use as rip rap and facing accents on structures if the rock is competent and as approved by the Coconino National Forest for barrier rock in off-road locations. Boulders not used for construction needs will be placed beyond the errant vehicle recovery zone in areas where natural rock outcrops exist. These boulders will be placed in random patterns and be partially buried to simulate natural boulders in the landscape.</p> <p>Natural-tone metals such as weathering steel with non-contrasting finish will be used for guardrails.</p> <p>Either planting pockets will be created in cut slopes or stepped retaining walls with plantings will be used at the various locations. Exact locations will be determined during final design.</p> <p>All asphalt not reused as part of the project will be removed from the site or incorporated into roadway embankments, and the roadbed reshaped, scarified, and revegetated. All abandoned sections of old highway will blend with existing landscape.</p> <p>Rock outcrops within the project limits will be left in place if stable and do not create a hazard to the traveling public, interfere with construction, or look out of place in the natural landscape.</p> <p>The clearing limits within National Forest lands shall be irregular and staked by the contractor for approval by the Coconino National Forest and ADOT prior to the start of clearing. Limits of clearing will generally extend from the top of slope cuts (including rounding) to the toe of fills. Straight clearing lines will be avoided where possible by varying the width of the area to be cleared or by leaving selected clumps of vegetation near the edge of the clearing limit. Tree wells and/or other techniques will be used to extend the preservation of vegetation at the edge of the clearing limits as agreed upon by ADOT, the Coconino National Forest, and the City of Sedona.</p> <p>The roadway medians and all fill slopes (including material waste areas) and cut slopes flatter than 1:2 (vertical to horizontal) will be planted with drought-tolerant native species using densities similar to adjacent undisturbed areas. No trees will be planted in the median. The medians and fill slopes will not have permanent irrigation systems. ADOT will maintain the median plantings between MP 304.5 to</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<p>MP 305.1 and MP 307.2 to MP 309.6. In the bifurcated roadway, ADOT will maintain plantings within the highway right-of-way/easement area.</p> <p>ADOT will work with the City of Sedona to design sign support systems that are “in character” with the urban area if traffic control structures are required as part of the improvements within the city limits.</p>
Drainage and Floodplain Considerations	No substantial impact.	
Water Resources, Section 404, NPDES	No substantial impact.	<p>The terms and conditions of the COE’s Nationwide 404 Permits will be followed for work affecting Oak Creek, Jacks Canyon, and any of the unnamed washes within the study area that are under the jurisdiction of COE.</p> <p>All required Section 401/404 permits will be obtained prior to construction.</p> <p>ADOT District will monitor all mitigation measures encompassing sedimentation and erosion control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas.</p> <p>The “temporary” erosion control measures will be left in place until ADOT determines that the site is stabilized as identified in the Storm Water Pollution Prevention Plan.</p> <p>Construction activities adjacent to Oak Creek will be coordinated with all of the regulatory and affected agencies. Roadway catch basins that discharge directly into Oak Creek will be constructed with skimmers in order to contain any hydrocarbons, debris, and sediment.</p> <p>Construction activities for the bridge that occurs at Oak Creek will take place during low-flow periods, from August through December, to avoid potential impacts to spawning fish. Any required water diversion structure shall allow water to continually flow to permit natural fish movement up- and downstream. The diversion structure must have the capability of being lowered or readily removed in case of a high-water event so that it will not be washed downstream. Reconstruction of the bridge will require the use of a catchment mechanism under the structure to intercept construction material inadvertently dropped from the structure. Runoff from the finished bridge deck will not discharge directly into Oak Creek. Storm water runoff from the deck will be directed to a holding tank with the capacity for a 25-year storm on-site runoff event with a 10 percent freeboard for hazardous material purposes. ADOT will be</p>

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<p>responsible for the maintenance of the holding tank. ADEQ shall be notified by the contractor before project construction begins.</p> <p>The contractor shall follow ADOT best management practices guidelines to minimize sediment from runoff periods from entering Oak Creek during construction and during bank stabilization and revegetation after the widening of the bridge at Oak Creek.</p> <p>Photographic documentation of the site conditions prior to construction of the Oak Creek bridge will be made by ADOT and included in the revegetation plans for use during site restoration.</p> <p>The contractor shall not use water from Oak Creek as a water supply for construction activities.</p>
Wetlands	No impact.	A retaining wall will be constructed to prevent any encroachment of the improvements from disturbing the wetlands located near Station 490+00 (MP 305).
Material Sources	No impact.	Materials from either private, commercial, or ADOT sources shall have separate environmental approvals from ADOT according to Section 1001-2 of <i>Arizona Department of Transportation Standard Specifications for Road and Bridge Construction</i> (2000 Edition).
Construction Debris Disposal	No impact.	Excess waste material and construction debris shall be disposed of at sites supplied by the contractor.
Hazardous Materials	No impact.	<p>The field survey indicated that the LUST site associated with the existing Village Square Chevron Station in Sedona has the potential to affect the project. ADOT EPG will review final plans relative to the ADEQ LUST database at the time final design plans are prepared to properly assess the potential impact.</p> <p>EPG's Hazardous Materials team will review the ADEQ UST and LUST databases for changes in status of existing facilities or the addition of new facilities when project plans are finalized.</p> <p>If previously unidentified or suspect hazardous materials are encountered during construction, work will stop at that location and the ADOT Engineer will be contacted to arrange for proper assessment, treatment, or disposal of those materials.</p>
Recreation	Substantial beneficial impact.	The extensions of the existing culverts and the new culverts that will be constructed along the bifurcated section will be sized to accommodate pedestrian and mountain bike use.

Table 14. Results of environmental analysis (Continued)

Resource	Impacts	Mitigation/Standard Practices to Reduce Impacts
		<p>The expansion of the parking areas at the two Bell Rock Trailheads (MP 307.3 and MP 309.9) will not be done at the same time. Construction activities at the trailheads/scenic pull-outs will take place between November 1 to April 1. Information signs will be placed along SR 179 to inform people of the closure of the trailheads/scenic pull-outs.</p> <p>Temporary signs and flashing lights will be placed at the H. T. Trail culvert near MP 309.9 to warn motorists of pedestrians crossing the highway. Signs will be posted at the Templeton and the north Red Rock Pathway trailheads, alerting the public on either side of this portion of the trail about the construction activities. During active construction, traffic control personnel will be present to assist trail users who want to cross SR 179 at this location.</p> <p>Bell Rock Vista multi-use facility will be replaced by constructing two scenic pull-outs, one near MP 308.3 (Station 496+200 northbound) and the second near MP 308.4 (Station 496+400 southbound). The scenic pull-out at MP 308.3 (Station 496+200 northbound) will include replacement of the restroom facilities. The restroom facility will be appropriately sized, sited, and designed to accommodate the expected uses of the scenic pull-out as well as the scenic and environmental factors of the site.</p>
Wilderness	No substantial impact.	<p>Tour bus parking at the scenic pull-out located near MP 308.3 (Station 496+000) will be prohibited. Tour buses will be directed to the scenic pull-out located near MP 307.3 (Station 494+400).</p>

V. SECONDARY AND CUMULATIVE EFFECTS

NEPA directs federal agencies to examine the consequences of proposed activities in light of an overall goal to protect and enhance the human environment. These consequences are grouped into the general categories of secondary and cumulative effects.

A. Secondary Effects

Secondary effects are broadly defined by the CEQ as those impacts that are caused by an action and occur later in time, or are farther removed in distance but are still reasonably foreseeable after the action has been completed. The secondary effects of the improvements to SR 179 will create changes to recreation uses and habitat within the Coconino National Forest. The addition of the scenic pull-outs will place increased pressure on the Coconino National Forest to provide more amenities such as restroom facilities and interpretive/area information at each pull-out. These pull-out areas will also create dispersed recreation opportunities such as informal trails and new access points into the National Forest, as well as increase the amount of trash generated by concentrating people at these locations. Habitat and vegetation degradation due to increased human activity in these areas will also be more likely to occur. While degradation is likely at the pull-out locations, the need to park along the highway through the remainder of the Coconino National Forest will be minimized and disturbance reduced.

Increased human activity and roadway construction will also affect wildlife behavior and habitat utilization. The overall effect will more than likely be minor as some species will move away from the highway and pull-out areas, while others will be attracted to these facilities based on their tolerance of human activity.

B. Cumulative Effects

Cumulative effects are the combined impacts on the environment that result from the incremental effect of the action when added to past, present, or reasonably foreseeable future actions. For this EA, past actions are those considered to have occurred since 1990, and foreseeable future actions are based on the best available information from the associated planning agencies. The most influential past, present, and future actions related to the action are the growth and development of the city of Sedona and the surrounding communities, the increase in tourism, and the increasing demand for recreation in the area. The results of this growth are likely to be more population, more employment, more revenue for the jurisdictions, and more demand on the area's built and natural resources.

Recent past development include the Sedona Cultural Park; the Mystic Hills housing development; and Phases I, II, and III of the Sedona Summit time-share development (99 units) on the west side of Sedona. Major developments pending or under construction consist of the Sedona Synagogue and Community Center; the Sedona Creative Life Center (accommodating 260 people); 8 additional time share units for the Los Abrigados Resort and Spa; the Hyatt Piñon Point Sedona, a complex immediately north of the intersection of SR 179 and SR 89A with 109 new time-share units and 30,000 square feet of new retail and restaurant space; the Amare Resort, a new 100-unit development in Uptown Sedona; Fairfield Resorts Sedona, with 72 time-share units; and a 100-unit hotel and a 108-unit condominium development north and east of the formerly planned Cliffs at Oak Creek development. Major developments planned in the foreseeable future include an 88-unit hotel, the Sedona Rouge, in West Sedona, which is pending permit approval, and Phase IV of the Sedona Summit time-share development, with an additional 62 units. These developments all rely heavily on the area's transportation system and, specifically, on use of SR 179.

Transportation corridors in the area are also undergoing change. SR 89A from Cottonwood to Sedona has recently been improved to a new four- and five-lane facility. Yavapai County has considered alternative routes from SR 179 to West Sedona, but these routes are no longer being examined by the County. The County has also recently completed a road paving project on Beaver Flats Road. The City of Sedona is assessing the reconfiguration of Ranger Road and its intersection with SR 89A.

The cumulative effects are discussed below in terms of the human, natural, and cultural environment.

1. Human Environment

The roadway improvements, as well as other transportation corridor improvements, will displace a number of existing residents, businesses, and utilities and alter access to existing land uses. Planned and proposed residential development in the immediate area will provide housing opportunities for displaced local residents to remain in the area. Some businesses will have their buildings affected or experience loss of parking. Businesses will also take advantage of the expected growth and the higher capacity transportation system provided in part by SR 179. Utilities will be relocated, as necessary, and access will be provided to accommodate existing land uses. The improvements to SR 179 and other transportation corridors will provide improved accessibility to major activity centers. SR 179 will support the growth that has occurred and provide capacity for projected growth trends.

With the increase in urban development, the ambient noise levels will increase. The area affected by the increase in noise levels will be somewhat moderated by the large amount of National Forest land surrounding the Village of Oak Creek and Sedona areas. Future traffic projections used for the noise analysis for the action were projected based on traffic generated by existing or anticipated future land uses within the study area.

The roadway improvements are not anticipated to have growth-inducing effects along the project corridor due to the unique jurisdictional setting in which the corridor is located and the strong comprehensive planning framework in place for the two communities through which the corridor passes. ADOT is trying to provide a roadway facility that will meet existing and future traffic demand over the next 20 years. Over the last two years of recorded traffic data (1997 and 2001), the existing traffic volumes have increased in-line with volumes projected in 1995, and no roadway capacity improvements have been made.

The SR 179 corridor is located entirely within three jurisdictions: the City of Sedona, Yavapai County (which includes the unincorporated community of the Village of Oak Creek), and the Coconino National Forest. Both the city of Sedona and the Village of Oak Creek are completely surrounded by National Forest land and, as a result, have built-in growth management boundaries. Neither jurisdiction can expand into Coconino National Forest lands without land exchange. Any substantial exchanges are highly unlikely due to the unique environmental quality of these lands, and the existence of a variety of special interest groups and individuals who are very concerned with preserving these lands as open space.

It should be noted that Amendment 12 to the Coconino National Forest Plan of June 1998 states that land exchanges that dispose of National Forest lands in the Sedona/Oak Creek Ecosystem Management Area will occur only if they result in acquisition of lands in the same planning area. Thus the private land base is not expected to increase; rather, it would be anticipated that any land exchanges would result in less private land within the Sedona/Oak Creek Ecosystem, as National Forest lands to be disposed of would be of a higher value than lands to be acquired.

In addition, both communities have established comprehensive planning frameworks (e.g., *Sedona Community Plan* [1998] and the *Big Park Community Plan* [1998]). These plans include specific land use components

which identify the ultimate use of all lands within the communities as well as those bordering SR 179. Due to a strong community planning commitment in both jurisdictions and the existence of special interest groups in each community, it is highly unlikely that the action of improving the SR 179 Corridor will induce any development over and above that already underway or contemplated.

2. Natural Environment

Construction of the selected action will contribute to the cumulative loss of existing vegetation and wildlife habitat and a general degradation of the inherent scenic quality of the area. The historical, current, and future development collectively add to the permanent loss of vegetation and habitat, as well as have adverse effects on the visual resources. The presence of National Forest lands in the study area helps minimize the loss of habitat, vegetation, and inherent scenic quality of the landscape by retaining the land for public use, and protecting its natural resources and character. However, uncontrolled or unrestricted recreation activities, such as off-road vehicles, from increasing recreation demand will damage vegetation and contribute to soil erosion. Events such as natural and human-caused forest/brush fires may also damage or cause loss of canopy cover and underbrush resulting in exposed soils that are susceptible to erosion.

For water resources, the most notable cumulative impact will be the loss of permeable surface area to absorb storm water flow and the increase in quantity and decrease in quality of surface water runoff from continued development in the area. However, the mitigation measures associated with this project, along with the stringent water quality standards associated with Oak Creek as a Unique Water of Arizona, will result in low cumulative impacts to water resources.

The study area is within an attainment area for air quality standards. The traffic projections used for the air quality analysis were based on the traffic generated by existing and anticipated future land uses within the study area. In addition, future year background pollutant conditions, based on regional air quality trends, were added to the emissions expected to be generated by the project. The results of the analyses indicate that regional and localized air quality will not be adversely affected.

3. Cultural Environment

Development impacts on the cultural environment also contribute to cumulative impacts. Estimates of the number of sites destroyed by cumulative activities on private land are not available. The selected action will not affect any known eligible, potentially eligible, or listed site on the NRHP. The cumulative effects within the approximately 38.9-square hectare (15-square mile) Sedona area represent 0.01 percent of the total state land base.

VI. PUBLIC INVOLVEMENT AND AGENCY COORDINATION

The following section describes the public involvement and agency coordination that have taken place or are planned as part of the environmental documentation process. A list of the persons involved in the preparation or review of the EA is also included.

A. Agency Coordination

A partnering kick-off meeting was held on May 24, 1994. An agency study team was formed as a result of this initial partnering commitment among the affected agencies. Workshop meetings were held with a steering committee consisting of representatives from the Coconino National Forest, FHWA, ADOT, COE, ADEQ, City of Sedona, Yavapai County, Coconino County, and the Village of Oak Creek Association. In addition, representatives from the Red Rock Pathways Committee also participated in the workshop meetings held throughout the study.

The date and location of each meeting held to date are listed below:

- November 2, 1994 - Red Rock State Park - Sedona
- January 5, 1995 - Red Rock State Park - Sedona
- March 24, 1995 - Christ Lutheran Church - Sedona
- June 8, 1995 - Wayside Chapel - Sedona
- August 30, 1995 - Wayside Chapel - Sedona
- October 25, 1995 - Wayside Chapel - Sedona
- December 13, 1995 - Wayside Chapel - Sedona
- March 13, 1996 - Sedona Public Library - Sedona
- May 29, 1996 - Sedona Public Library - Sedona
- September 24, 1996 - Sedona Public Library - Sedona
- November 22, 1996 - Sedona Public Library - Sedona
- March 13, 1997 - Sedona Public Library - Sedona

Individual meetings were held throughout the project with the Village of Oak Creek Association and City of Sedona staff. Coordination letters were sent to the following agencies:

- Arizona Department of Environmental Quality
- Arizona Department of Public Safety
- Arizona Department of Water Resources
- Arizona Game and Fish Department
- City of Sedona
- Coconino County
- Coconino National Forest
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Village of Oak Creek Association
- Yavapai County

In addition to these agencies, the EPA has also reviewed and provided comments on the Draft EA. A list of the contacts and dates of contact for tribal consultation can be found in Appendix E, government agency comments and applicable responses can be found in Appendix J.

B. Public Involvement

Three public involvement meetings and one public hearing were held to obtain public comments regarding issues and concerns associated with the improvements to SR 179. The date and location of each meeting, the dates and the name of the newspaper that published the public notice, and a summary of each meeting are provided below.

- **Meeting Date and Location:** February 7, 1995, at West Sedona School Cafeteria in the city of Sedona.
Publish Date: January 25, 1996 and February 1, 1996, in the *Red Rock News*³
Meeting Summary: The purpose the initial public meeting was to display and discuss the *SR 179 Corridor Study* recommendations from 1992 and obtain public input regarding issues associated with the current roadway improvement study. Seventy-four people attended the meeting and each received a handout describing the study purpose, a graphic portraying the 1992 recommendations, and a diagram of the study process. A brief presentation was made by ADOT and its consultants on the 1992 *SR 179 Corridor Study* recommendations. From the 74 participants, 62 written comment sheets with numerous specific comments were submitted to ADOT. From the 62 written comments, 12 specific comments were made regarding the study's process. Eight of these specific comments were complaints about the slow progress of the roadway improvements. Ninety-two specific comments were made in support of roadway improvements, with 25 comments in general support, 17 supported the addition of turn lanes and passing lanes, 14 specified the need for the improved scenic pull-outs, and ten agreed with the need for shoulder widening. Twenty-two specific comments were made in opposition to roadway improvements to SR 179. Ten specific comments were made against a four-lane facility, five stated that they supported only an alternative route, three were against a five-lane facility in the Village of Oak Creek, and three suggested redirecting traffic through Cottonwood. In terms of general comments and issues, five commenters recommended that the speed limit along SR 179 be maintained or decreased and four wanted the scenic pull-outs kept away from residences.
- **Meeting Date and Location:** September 27, 1995, at West Sedona School Gymnasium in the city of Sedona.
Publish Date: September 13 and 20, 1995, in the *Red Rock News*.
Meeting Summary: The purpose of the public meeting was to present and discuss two alternatives for improving SR 179 and obtain public input regarding issues and concerns associated with the improvements. At this second public meeting, approximately 108 people attended and each received a handout describing the study purpose, a description of alternatives studied to date, scenic pull-out locations, and ADOT's programmed projects. A brief presentation was made by ADOT and its consultants on the two alternatives and various median landscape treatments. From the 108 participants, 33 written comment sheets with numerous specific comments were submitted to ADOT. Ten specific comments favored a combination four-lane divided and five-lane facility, and five stated that turn lanes and shoulders would be sufficient in conjunction with the scenic pull-outs, making a four-lane facility unnecessary. Other specific comments were made regarding the need for improved roadway through the Roller Coaster area, recommending another pull-out south of the Village of Oak Creek, suggesting more lane separation, and generally agreeing to the need for roadway improvements and the scenic pull-out locations. A petition with 49 signatures from

³ The *Red Rock News* has a distribution of approximately 7,750 papers, the *Cottonwood Journal Extra* 7,395 papers, and the *Camp Verde Journal* 2,900 papers.

businesses in the Village of Oak Creek was also submitted urging priority for that segment and inclusion of sidewalks as part of the roadway improvements.

- **Meeting Date and Location:** April 30, 1996, at Big Park School Gymnasium in the Village of Oak Creek.

Publish Date: April 24 and 26, 1996, in the *Red Rock News*, *Cottonwood Journal Extra* and *Camp Verde Journal*.

Meeting Summary: The purpose of the public meeting was to present and discuss three alternatives for improving SR 179 and obtain public input regarding issues and concerns associated with the improvements. At this third public meeting, 94 people attended and each received a handout describing the study purpose, a description each of the three alternatives studied, scenic pull-out locations, ADOT's current programmed projects, and an evaluation matrix comparing each of the three alternatives. A brief presentation was made by ADOT and its consultants on the three alternatives. (These three alternatives are described previously in Section II. C.) From the 94 participants, 81 written comment sheets with numerous specific comments were submitted to ADOT. Thirty specific comments favored Alternative C, six favored either Alternative B or C, 16 disliked Alternative A (due to the potential impacts at the Methodist Church), and 16 suggested reconsidering the area at St. Luke's Church. Other specific comments included wanting to improve intersection safety, expediting the study process, suggesting that the construction should begin at the northern end and proceed south while other felt that construction should begin at the southern end and proceed north, and wanting problems at the "Y" addressed, and suggesting one-way traffic northbound at the "Y," with southbound traffic using Brewer/Ranger Roads.

- **Hearing Date and Location:** February 18, 1999, at Big Park School Gymnasium in the Village of Oak Creek.

Publish Date: Display advertisements for the public hearing were placed in the *Red Rock News*, *Cottonwood Journal Extra*, and *Camp Verde Journal* on February 3 and 10, 1999. The comment period for the Draft EA was from January 20, 1999, to March 8, 1999. Copies of the Draft EA were available for review at the Sedona Public Library.

Hearing Summary: Approximately 400 people attended the public hearing. Large-scale maps, visual simulations, and typical sections were available to display project characteristics. A brief presentation on the alternative and potential environmental impacts was given by ADOT and its consultant team. Project representatives were available to explain the action and to answer questions. A description of the action was provided in a handout with a comment sheet. A copy of the handout is included in Appendix J. A copy of the public hearing transcript is provided in Appendix L.

Comments on the Draft EA were received by letter, written comment forms, and through a transcript of oral comments made to the court reporter in attendance at the hearing. Approximately 2,400 people commented either through the court reporter, completed comment forms provided at the public hearing, sent letters to ADOT, or signed petitions within the comment period on the Draft EA. The written comments generally fell into one of the following categories:

- Support for Alternative C (Selected Alternative)
- Support for Alternative C with minor realignments, revisions to median openings, or other revisions related to individual properties
- Support for a Ranger Road alternative in lieu of improvements to SR 179 between Ranger Road and SR 89A
- Support for bypass alternatives in lieu of Alternative C, such as Red Rock Crossing
- Support for the No Action Alternative for all of SR 179

- Support for the No Action Alternative in city limits of Sedona
- Support for a three-lane section in lieu of Alternative C

Those who opposed the roadway improvements related specific concerns including adverse impacts to the environment, specifically to the scenic quality of the area; increased noise impacts from the four- and five-lane facilities; economic impacts from the loss of parking spaces at the Hillside Shops; magnitude of construction impacts on businesses and residences in addition to general traffic delays; design speeds of the improvements were too high; lack of pedestrian and bicycle accommodation along SR 179; the change from a rural, scenic driving experience to one of a high-speed, interstate-like highway; the four- and five-lane typical sections were over-designed and not necessary; the retaining walls would be obvious and detract substantially from the scenic setting; and the detrimental change to people's quality of life.

On March 9, 1999, the Mayor and City Council of the City of Sedona passed a resolution opposing the roadway improvements because the four- and five- lane roadway "are inconsistent with the goals of the *Sedona Community Plan* and will result in a radical change to the character of the Sedona area." ADOT and their consultants met with the Sedona City Council (March 26, 1999) to present the selected alternative (Alternative C). The Council appointed a seven-member committee consisting of council members, city staff, business owners, and concerned citizens on April 13, 1999, to work with ADOT to address the City of Sedona's concerns. The Sedona Technical Advisory Committee met 12 times from May to December 1999. The Committee worked with ADOT and their consultant during the period and agreed that the details of many of their issues would be more appropriately dealt with during the two to three year final design phase of the project. On July 27, 1999, the City Council voted to accept the recommendations by the Committee. The Committee recommended to the City Council on January 11, 2000, that a new, more technically oriented committee continue working with ADOT during the design phase and for ADOT to proceed with the SR 179 improvements. The City Council accepted the Committee's recommendation and disbanded the Committee. In addition to the Sedona City Council and Committee, ADOT and their consultants also met with the Oak Creek Orchards and Exposures Gallery business owners after the February 18, 1999, public hearing.

In March 2001, the Sedona City Council requested that ADOT have an engineering firm that had not been involved in the SR 179 study be brought in to address the basis and reasons for converting a four-lane road to a two-lane road and under what conditions this would be workable. The Sedona City Council selected an engineering firm from a list provided by ADOT with ADOT's stipulation that the office undertaking the evaluation be outside of Arizona. The independent engineering report stated that a single lane of traffic could operate at an acceptable level of service in the peak hour with upwards of 20,000 vehicles per day if analyzed as an arterial street. All examples given in the report were of arterial streets that exhibited little reduction in LOS, had few turning movements, and adequate traffic flow at traffic signals. No examples of lane conversions on rural highways could be found. LOS criteria and driver expectations are much more rigorous for rural highways than for arterial streets. Therefore, SR 179 may work as a two-lane roadway in 2017 if it were held against the standards of an arterial street rather than the standards for a two-lane highway. SR 179 was analyzed as a rural highway in the DCR, and would require two through lanes in each direction in the design year given this criterion.

The independent engineering report also evaluated data and methodologies used in the SR 179 DCR dated May 2000. The independent engineer's report stated that the methodologies used for traffic data collection and design year projections were in line with current standards and appeared appropriate for this study. The decision to analyze the roadway as a rural highway (versus an arterial street) factored greatly in the resulting LOS analysis, and reasons were given to consider analyzing SR 179 as an arterial street. The rural highway analysis showed a LOS A or B in the design year for Alternative C, while the arterial street analysis yielded a LOS C or D in the design year for the No Action Alternative and upgraded two-lane roadway (with adequate

shoulders) alternatives. The report also indicated that a second exclusive left-turn lane on the northbound approach of SR 179 to SR 89A would diminish delay and queue lengths south of the intersection. Review of accident data for SR 179 shows an accident history approximately equal to the statewide rates for rural two-lane highways.

The accident rate for a segment of SR 89A (MP 371.0 to MP 372.2) was substantially higher than the statewide average for two-lane rural highways, due in part to the many access points. In addition to the three public information meetings, one public hearing, and meetings with the Sedona City Council/Sedona Design Advisory Committee, there have been numerous meetings with various organizations including a two-day open house. These meetings are listed below:

- August 25 and 26, 2000 - Open House at the Best Western Inn of Sedona (copy of handout included in Appendix J)
- October 30, 2000 - 4R's in Sedona
- November 1, 2000 - Sedona Women's Club in Sedona
- November 27, 2000 - Sedona City Council
- November 28, 2000 - Voice of Choice
- December 13, 2000 - Voice of Choice
- January 26, 2001 - Voice of Choice
- March 9, 2001 - Voice of Choice
- March 21, 2001 - Voice of Choice

The Voice of Choice is a citizens' group organized to oppose the expansion of SR 179 to four and five lanes. Members of the community have also organized a coalition of organizations identified as the "Positive Voice" to provide support for the Selected Alternative (Alternative C). This coalition of organizations includes the Sedona/Verde Valley Republican Men's Club, Sedona Village Business Association, Northern Arizona Healthcare, Yavapai County Sheriff's Office, Coconino County Sheriff's Department, Sedona Fire District, Laidlaw Transportation Company, Citizens for an Alternative Route, Sedona Verde Valley Association of Realtors, and the Sedona Airport Support Association.

Appendix M summarizes commonly expressed comments received on the *Draft Environmental Assessment* since the February 1999 public hearing along with responses to those comments. A complete listing of comments received, and responses to those comments, are on file at ADOT EPG. ADOT, FHWA, and the Coconino National Forest have considered all public comments and input in evaluating the viability of Alternative C. The purpose and need can best be addressed with the least environmental impact by implementing Alternative C.

C. Project Coordination

Preparation of this environmental assessment was the responsibility of Diane Simpson-Colebank of Logan Simpson Design Inc. Technical investigations and information were provided for cultural resources by Bettina Rosenberg of ADOT EPG, and by Don Weaver and Nathan Lefthand from Plateau Mountain Desert Research; Preliminary Initial Site Assessment by Ed Green of ADOT EPG; air analysis by Fred Garcia of ADOT EPG; noise analysis by Fred Garcia of ADOT EPG and by Pat Higgins of Higgins and Associates; drainage by Dave Schaub of BRW; visual resources by Wayne Iverson of Scenic Resource Management; engineering input from George Fies and Bob Hansman of BRW and Rob Lemke and Marv Small of Aztec Engineering; and public involvement by John McNamara of BRW. Project representatives from ADOT included George Wallace (Pre-Design Studies Section), Don Dorman (Flagstaff District), Chuck Gillick (Flagstaff District), Dave Mellgren

(Statewide Project Management), Richard Moeur (Traffic Design), and Jim Rindone (EPG). Coconino National Forest representatives included Ken Anderson, Judy Adams, Jim Beard, Bryce Lloyd, Jerome Chapin, Jennifer Burns, and Larry Porkorny. Project representatives included Ken Davis, Steve Thomas, and Bill Vachon, Nate Banks, Tom Deitering, and Rebeca Rivera from FHWA; Dan Salzler from ADEQ; and Larry Flatau from COE. City of Sedona representatives included John O'Brien, Carol Johnson, and Mike Raber.

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